CETIFICATION

| | | | |
|---|---|---|---|
| SDG No: | JC21229 | Laboratory: | Accutest, New Jersey |
| Site: | BMS, Building 5 Area, PR Humacao, PR | Matrix: | Soil/Groundwater |

SUMMARY: Groundwater and soil samples (Table 1) were collected on the BMSMC facility – Building 5 Area. The BMSMC facility is located in Humacao, PR. Samples were taken May 27, 2016 and were analyzed in Accutest Laboratory of Dayton, New Jersey for the ABN TCL Special List (1,4-Dioxane and Naphthalene were analyzed following the SIM technique); TCL pesticides list; and for low molecular weight alcohols (LMWA) the results were reported under SDG No.: JC21229. Results were validated using the latest validation guidelines (July, 2015) of the EPA Hazardous Waste Support Section. The analyses performed are shown in Table 1. Individual data review worksheets are enclosed for each target analyte group. The data sample organic data samples summary form shows for analytes results that were qualified.

In summary the results are valid and can be used for decision taking purposes.

Table 1. Samples analyzed and analysis performed

| SAMPLE ID | SAMPLE DESCRIPTION | MATRIX | ANALYSIS PERFORMED |
|---|---|---|---|
| JC21229-1 | SB102 (5.5-6.5) | Soil | ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA |
| JC21229-2 | SB102 (7-8) | Soil | ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA |
| JC21229-3 | SB102-GWD | Groundwater | ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA |
| JC21229-4 | BPEB-30 | Equipment Blank | ABN TCL special list; 1,-4-dioxane and Naphthalene (SIM); Pesticides TCL list; LMWA |

Reviewer Name: Rafael Infante
Chemist License 1888

Signature:


Date: June 23, 2016

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (5.5-6.5) | | |
| **Lab Sample ID:** | JC21229-1 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3546 | **Percent Solids:** | 78.6 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 6P26712.D | 1 | 06/06/16 | AC | 06/02/16 | OP94419 | E6P1239 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 30.4 g | 1.0 ml |
| Run #2 | | |

**ABN TCL Special List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 95-57-8 | 2-Chlorophenol | ND | 84 | 21 | ug/kg | |
| 59-50-7 | 4-Chloro-3-methyl phenol | ND | 210 | 26 | ug/kg | |
| 120-83-2 | 2,4-Dichlorophenol | ND | 210 | 36 | ug/kg | |
| 105-67-9 | 2,4-Dimethylphenol | ND | 210 | 74 | ug/kg | |
| 51-28-5 | 2,4-Dinitrophenol | ND | 210 | 160 | ug/kg | |
| 534-52-1 | 4,6-Dinitro-o-cresol | ND | 210 | 45 | ug/kg | |
| 95-48-7 | 2-Methylphenol | ND | 84 | 27 | ug/kg | |
| | 3&4-Methylphenol | ND | 84 | 34 | ug/kg | |
| 88-75-5 | 2-Nitrophenol | ND | 210 | 28 | ug/kg | |
| 100-02-7 | 4-Nitrophenol | ND | 420 | 110 | ug/kg | |
| 87-86-5 | Pentachlorophenol | ND | 210 | 39 | ug/kg | |
| 108-95-2 | Phenol | ND | 84 | 22 | ug/kg | |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | ND | 210 | 28 | ug/kg | |
| 95-95-4 | 2,4,5-Trichlorophenol | ND | 210 | 31 | ug/kg | |
| 88-06-2 | 2,4,6-Trichlorophenol | ND | 210 | 25 | ug/kg | |
| 83-32-9 | Acenaphthene | ND | 42 | 14 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 42 | 21 | ug/kg | |
| 98-86-2 | Acetophenone | ND | 210 | 9.0 | ug/kg | |
| 120-12-7 | Anthracene | ND | 42 | 26 | ug/kg | |
| 1912-24-9 | Atrazine | ND | 84 | 18 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 17.2 | 42 | 12 | ug/kg | J |
| 50-32-8 | Benzo(a)pyrene | ND | 42 | 19 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 42 | 18 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 42 | 21 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 42 | 20 | ug/kg | |
| 101-55-3 | 4-Bromophenyl phenyl ether | ND | 84 | 16 | ug/kg | |
| 85-68-7 | Butyl benzyl phthalate | ND | 84 | 10 | ug/kg | |
| 92-52-4 | 1,1'-Biphenyl | ND | 84 | 5.7 | ug/kg | |
| 100-52-7 | Benzaldehyde | ND | 210 | 10 | ug/kg | |
| 91-58-7 | 2-Chloronaphthalene | ND | 84 | 10 | ug/kg | |
| 106-47-8 | 4-Chloroaniline | ND | 210 | 15 | ug/kg | |
| 86-74-8 | Carbazole | ND | 84 | 6.1 | ug/kg | |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (5.5-6.5) | | |
| **Lab Sample ID:** | JC21229-1 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3546 | **Percent Solids:** | 78.6 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

**ABN TCL Special List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 105-60-2 | Caprolactam | ND | 84 | 17 | ug/kg | |
| 218-01-9 | Chrysene | ND | 42 | 13 | ug/kg | |
| 111-91-1 | bis(2-Chloroethoxy)methane | ND | 84 | 9.0 | ug/kg | |
| 111-44-4 | bis(2-Chloroethyl)ether | ND | 84 | 18 | ug/kg | |
| 108-60-1 | bis(2-Chloroisopropyl)ether | ND | 84 | 15 | ug/kg | |
| 7005-72-3 | 4-Chlorophenyl phenyl ether | ND | 84 | 14 | ug/kg | |
| 121-14-2 | 2,4-Dinitrotoluene | ND | 42 | 13 | ug/kg | |
| 606-20-2 | 2,6-Dinitrotoluene | ND | 42 | 21 | ug/kg | |
| 91-94-1 | 3,3'-Dichlorobenzidine | ND | 84 | 35 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 42 | 18 | ug/kg | |
| 132-64-9 | Dibenzofuran | ND | 84 | 17 | ug/kg | |
| 84-74-2 | Di-n-butyl phthalate | ND | 84 | 6.8 | ug/kg | |
| 117-84-0 | Di-n-octyl phthalate | ND | 84 | 10 | ug/kg | |
| 84-66-2 | Diethyl phthalate | ND | 84 | 8.9 | ug/kg | |
| 131-11-3 | Dimethyl phthalate | ND | 84 | 7.4 | ug/kg | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | ND | 84 | 9.8 | ug/kg | |
| 206-44-0 | Fluoranthene | 48.5 | 42 | 19 | ug/kg | |
| 86-73-7 | Fluorene | ND | 42 | 19 | ug/kg | |
| 118-74-1 | Hexachlorobenzene | ND | 84 | 11 | ug/kg | |
| 87-68-3 | Hexachlorobutadiene | ND | 42 | 17 | ug/kg | |
| 77-47-4 | Hexachlorocyclopentadiene | ND | 420 | 17 | ug/kg | |
| 67-72-1 | Hexachloroethane | ND | 210 | 21 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 42 | 20 | ug/kg | |
| 78-59-1 | Isophorone | ND | 84 | 9.0 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 84 | 8.2 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 84 | 9.5 | ug/kg | |
| 88-74-4 | 2-Nitroaniline | ND | 210 | 9.9 | ug/kg | |
| 99-09-2 | 3-Nitroaniline | ND | 210 | 10 | ug/kg | |
| 100-01-6 | 4-Nitroaniline | ND | 210 | 11 | ug/kg | |
| 98-95-3 | Nitrobenzene | ND | 84 | 16 | ug/kg | |
| 621-64-7 | N-Nitroso-di-n-propylamine | ND | 84 | 12 | ug/kg | |
| 86-30-6 | N-Nitrosodiphenylamine | ND | 210 | 15 | ug/kg | |
| 85-01-8 | Phenanthrene | 27.0 | 42 | 14 | ug/kg | J |
| 129-00-0 | Pyrene | 40.0 | 42 | 13 | ug/kg | J |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | ND | 210 | 11 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 367-12-4 | 2-Fluorophenol | 69% | | 30-106% |
| 4165-62-2 | Phenol-d5 | 69% | | 30-106% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (5.5-6.5) | | |
| **Lab Sample ID:** | JC21229-1 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3546 | **Percent Solids:** | 78.6 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

**ABN TCL Special List**

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 118-79-6 | 2,4,6-Tribromophenol | 68% | | 24-140% |
| 4165-60-0 | Nitrobenzene-d5 | 79% | | 26-122% |
| 321-60-8 | 2-Fluorobiphenyl | 85% | | 36-112% |
| 1718-51-0 | Terphenyl-d14 | 90% | | 36-132% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 3M62168.D

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (5.5-6.5) | | |
| **Lab Sample ID:** | JC21229-1 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D BY SIM SW846 3546 | **Percent Solids:** | 78.6 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 3M62168.D | 1 | 06/11/16 | JJ | 06/02/16 | OP94419A | E3M2930 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 30.4 g | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 123-91-1 | 1,4-Dioxane [a] | ND | 4.2 | 0.84 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 4.2 | 0.51 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 77% | | 15-138% |
| 321-60-8 | 2-Fluorobiphenyl | 89% | | 12-148% |
| 1718-51-0 | Terphenyl-d14 | 98% | | 10-157% |

(a) Not accredited for this compound at the time of analysis, but all method requirements were followed.


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (5.5-6.5) | | |
| **Lab Sample ID:** | JC21229-1 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846-8015C (DAI) | **Percent Solids:** | 78.6 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | GH105335.D | 1 | 06/02/16 | XPL | n/a | n/a | GGH5308 |
| Run #2 | | | | | | | |

| | Initial Weight |
|---|---|
| Run #1 | 5.1 g |
| Run #2 | |

**Low Molecular Alcohol List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 64-17-5 | Ethanol | ND | 120 | 86 | ug/kg | |
| 78-83-1 | Isobutyl Alcohol | ND | 120 | 73 | ug/kg | |
| 67-63-0 | Isopropyl Alcohol | ND | 120 | 71 | ug/kg | |
| 71-23-8 | n-Propyl Alcohol | ND | 120 | 50 | ug/kg | |
| 71-36-3 | n-Butyl Alcohol | ND | 120 | 68 | ug/kg | |
| 78-92-2 | sec-Butyl Alcohol | ND | 120 | 66 | ug/kg | |
| 67-56-1 | Methanol | ND | 250 | 60 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 111-27-3 | Hexanol | 88% | | 52-141% |
| 111-27-3 | Hexanol | 85% | | 52-141% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4G68955.D

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (5.5-6.5) | | |
| **Lab Sample ID:** | JC21229-1 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8081B SW846 3546 | **Percent Solids:** | 78.6 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4G68955.D | 1 | 06/07/16 | KD | 06/01/16 | OP94393 | G4G1813 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 15.1 g | 10.0 ml |
| Run #2 | | |

**Pesticide TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 309-00-2 | Aldrin | ND | 0.84 | 0.75 | ug/kg | |
| 319-84-6 | alpha-BHC | ND | 0.84 | 0.56 | ug/kg | |
| 319-85-7 | beta-BHC | ND | 0.84 | 0.52 | ug/kg | |
| 319-86-8 | delta-BHC | ND | 0.84 | 0.33 | ug/kg | |
| 58-89-9 | gamma-BHC (Lindane) | ND | 0.84 | 0.38 | ug/kg | |
| 5103-71-9 | alpha-Chlordane | ND | 0.84 | 0.45 | ug/kg | |
| 5103-74-2 | gamma-Chlordane | ND | 0.84 | 0.64 | ug/kg | |
| 60-57-1 | Dieldrin | ND | 0.84 | 0.66 | ug/kg | |
| 72-54-8 | 4,4'-DDD | ND | 0.84 | 0.31 | ug/kg | |
| 72-55-9 | 4,4'-DDE | ND | 0.84 | 0.28 | ug/kg | |
| 50-29-3 | 4,4'-DDT | ND | 0.84 | 0.32 | ug/kg | |
| 72-20-8 | Endrin | ND | 0.84 | 0.30 | ug/kg | |
| 1031-07-8 | Endosulfan sulfate | ND | 0.84 | 0.48 | ug/kg | |
| 7421-93-4 | Endrin aldehyde | ND | 0.84 | 0.63 | ug/kg | |
| 959-98-8 | Endosulfan-I | ND | 0.84 | 0.28 | ug/kg | |
| 33213-65-9 | Endosulfan-II | ND | 0.84 | 0.80 | ug/kg | |
| 76-44-8 | Heptachlor | ND | 0.84 | 0.69 | ug/kg | |
| 1024-57-3 | Heptachlor epoxide | ND | 0.84 | 0.35 | ug/kg | |
| 72-43-5 | Methoxychlor | ND | 1.7 | 0.47 | ug/kg | |
| 53494-70-5 | Endrin ketone | ND | 0.84 | 0.44 | ug/kg | |
| 8001-35-2 | Toxaphene | ND | 21 | 15 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 877-09-8 | Tetrachloro-m-xylene | 83% | | 24-136% |
| 877-09-8 | Tetrachloro-m-xylene | 75% | | 24-136% |
| 2051-24-3 | Decachlorobiphenyl | 84% | | 10-153% |
| 2051-24-3 | Decachlorobiphenyl | 74% | | 10-153% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (7-8) | | |
| **Lab Sample ID:** | JC21229-2 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3546 | **Percent Solids:** | 86.2 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | 6P26713.D | 1 | 06/06/16 | AC | 06/02/16 | OP94419 | E6P1239 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 15.1 g | 1.0 ml |
| Run #2 | | |

**ABN TCL Special List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 95-57-8 | 2-Chlorophenol | ND | 150 | 38 | ug/kg | |
| 59-50-7 | 4-Chloro-3-methyl phenol | ND | 380 | 47 | ug/kg | |
| 120-83-2 | 2,4-Dichlorophenol | ND | 380 | 66 | ug/kg | |
| 105-67-9 | 2,4-Dimethylphenol | ND | 380 | 140 | ug/kg | |
| 51-28-5 | 2,4-Dinitrophenol | ND | 380 | 290 | ug/kg | |
| 534-52-1 | 4,6-Dinitro-o-cresol | ND | 380 | 82 | ug/kg | |
| 95-48-7 | 2-Methylphenol | ND | 150 | 49 | ug/kg | |
| | 3&4-Methylphenol | ND | 150 | 63 | ug/kg | |
| 88-75-5 | 2-Nitrophenol | ND | 380 | 51 | ug/kg | |
| 100-02-7 | 4-Nitrophenol | ND | 770 | 210 | ug/kg | |
| 87-86-5 | Pentachlorophenol | ND | 380 | 72 | ug/kg | |
| 108-95-2 | Phenol | ND | 150 | 40 | ug/kg | |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | ND | 380 | 51 | ug/kg | |
| 95-95-4 | 2,4,5-Trichlorophenol | ND | 380 | 58 | ug/kg | |
| 88-06-2 | 2,4,6-Trichlorophenol | ND | 380 | 46 | ug/kg | |
| 83-32-9 | Acenaphthene | ND | 77 | 27 | ug/kg | |
| 208-96-8 | Acenaphthylene | ND | 77 | 39 | ug/kg | |
| 98-86-2 | Acetophenone | ND | 380 | 17 | ug/kg | |
| 120-12-7 | Anthracene | ND | 77 | 47 | ug/kg | |
| 1912-24-9 | Atrazine | ND | 150 | 33 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | 92.5 | 77 | 22 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | 51.5 | 77 | 35 | ug/kg | J |
| 205-99-2 | Benzo(b)fluoranthene | 64.5 | 77 | 34 | ug/kg | J |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 77 | 38 | ug/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 77 | 36 | ug/kg | |
| 101-55-3 | 4-Bromophenyl phenyl ether | ND | 150 | 30 | ug/kg | |
| 85-68-7 | Butyl benzyl phthalate | ND | 150 | 19 | ug/kg | |
| 92-52-4 | 1,1'-Biphenyl | ND | 150 | 11 | ug/kg | |
| 100-52-7 | Benzaldehyde | ND | 380 | 19 | ug/kg | |
| 91-58-7 | 2-Chloronaphthalene | ND | 150 | 18 | ug/kg | |
| 106-47-8 | 4-Chloroaniline | ND | 380 | 28 | ug/kg | |
| 86-74-8 | Carbazole | ND | 150 | 11 | ug/kg | |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (7-8) | | |
| **Lab Sample ID:** | JC21229-2 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3546 | **Percent Solids:** | 86.2 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

**ABN TCL Special List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 105-60-2 | Caprolactam | ND | 150 | 30 | ug/kg | |
| 218-01-9 | Chrysene | 41.2 | 77 | 24 | ug/kg | J |
| 111-91-1 | bis(2-Chloroethoxy)methane | ND | 150 | 16 | ug/kg | |
| 111-44-4 | bis(2-Chloroethyl)ether | ND | 150 | 33 | ug/kg | |
| 108-60-1 | bis(2-Chloroisopropyl)ether | ND | 150 | 28 | ug/kg | |
| 7005-72-3 | 4-Chlorophenyl phenyl ether | ND | 150 | 25 | ug/kg | |
| 121-14-2 | 2,4-Dinitrotoluene | ND | 77 | 24 | ug/kg | |
| 606-20-2 | 2,6-Dinitrotoluene | ND | 77 | 39 | ug/kg | |
| 91-94-1 | 3,3'-Dichlorobenzidine | ND | 150 | 64 | ug/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 77 | 34 | ug/kg | |
| 132-64-9 | Dibenzofuran | ND | 150 | 31 | ug/kg | |
| 84-74-2 | Di-n-butyl phthalate | ND | 150 | 13 | ug/kg | |
| 117-84-0 | Di-n-octyl phthalate | ND | 150 | 19 | ug/kg | |
| 84-66-2 | Diethyl phthalate | ND | 150 | 16 | ug/kg | |
| 131-11-3 | Dimethyl phthalate | ND | 150 | 14 | ug/kg | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | ND | 150 | 18 | ug/kg | |
| 206-44-0 | Fluoranthene | ND | 77 | 34 | ug/kg | |
| 86-73-7 | Fluorene | ND | 77 | 35 | ug/kg | |
| 118-74-1 | Hexachlorobenzene | ND | 150 | 19 | ug/kg | |
| 87-68-3 | Hexachlorobutadiene | ND | 77 | 31 | ug/kg | |
| 77-47-4 | Hexachlorocyclopentadiene | ND | 770 | 31 | ug/kg | |
| 67-72-1 | Hexachloroethane | ND | 380 | 38 | ug/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 77 | 36 | ug/kg | |
| 78-59-1 | Isophorone | ND | 150 | 16 | ug/kg | |
| 90-12-0 | 1-Methylnaphthalene | ND | 150 | 15 | ug/kg | |
| 91-57-6 | 2-Methylnaphthalene | ND | 150 | 17 | ug/kg | |
| 88-74-4 | 2-Nitroaniline | ND | 380 | 18 | ug/kg | |
| 99-09-2 | 3-Nitroaniline | ND | 380 | 19 | ug/kg | |
| 100-01-6 | 4-Nitroaniline | ND | 380 | 20 | ug/kg | |
| 98-95-3 | Nitrobenzene | ND | 150 | 30 | ug/kg | |
| 621-64-7 | N-Nitroso-di-n-propylamine | ND | 150 | 22 | ug/kg | |
| 86-30-6 | N-Nitrosodiphenylamine | ND | 380 | 28 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 77 | 26 | ug/kg | |
| 129-00-0 | Pyrene | 71.7 | 77 | 25 | ug/kg | J |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | ND | 380 | 20 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 367-12-4 | 2-Fluorophenol | 65% | | 30-106% |
| 4165-62-2 | Phenol-d5 | 64% | | 30-106% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (7-8) | | |
| **Lab Sample ID:** | JC21229-2 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3546 | **Percent Solids:** | 86.2 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

**ABN TCL Special List**

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 118-79-6 | 2,4,6-Tribromophenol | 62% | | 24-140% |
| 4165-60-0 | Nitrobenzene-d5 | 76% | | 26-122% |
| 321-60-8 | 2-Fluorobiphenyl | 81% | | 36-112% |
| 1718-51-0 | Terphenyl-d14 | 83% | | 36-132% |

(a) Elevated detection limit due to low volume of bad matrix sample extracted.


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (7-8) | | |
| **Lab Sample ID:** | JC21229-2 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D BY SIM SW846 3546 | **Percent Solids:** | 86.2 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | 4P16864.D | 1 | 06/13/16 | LK | 06/02/16 | OP94419A | E4P896 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 15.1 g | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 123-91-1 | 1,4-Dioxane | ND | 7.7 | 1.5 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 7.7 | 0.94 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 66% | | 15-138% |
| 321-60-8 | 2-Fluorobiphenyl | 87% | | 12-148% |
| 1718-51-0 | Terphenyl-d14 | 82% | | 10-157% |

(a) Elevated detection limit due to low volume of bad matrix sample extracted.

COLEGIO QUÍMICOS DE PUERTO RICO
Rafael Infante Méndez
QUÍMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (7-8) | | |
| **Lab Sample ID:** | JC21229-2 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846-8015C (DAI) | **Percent Solids:** | 86.2 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | GH105332.D | 1 | 06/02/16 | XPL | n/a | n/a | GGH5308 |
| Run #2 | | | | | | | |

| | Initial Weight |
|---|---|
| Run #1 | 5.0 g |
| Run #2 | |

**Low Molecular Alcohol List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 64-17-5 | Ethanol | ND | 120 | 80 | ug/kg | |
| 78-83-1 | Isobutyl Alcohol | ND | 120 | 68 | ug/kg | |
| 67-63-0 | Isopropyl Alcohol | ND | 120 | 66 | ug/kg | |
| 71-23-8 | n-Propyl Alcohol | ND | 120 | 47 | ug/kg | |
| 71-36-3 | n-Butyl Alcohol | ND | 120 | 63 | ug/kg | |
| 78-92-2 | sec-Butyl Alcohol | ND | 120 | 62 | ug/kg | |
| 67-56-1 | Methanol | ND | 230 | 56 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 111-27-3 | Hexanol | 87% | | 52-141% |
| 111-27-3 | Hexanol | 97% | | 52-141% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4G68956.D

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102 (7-8) | | |
| **Lab Sample ID:** | JC21229-2 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | SO - Soil | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8081B SW846 3546 | **Percent Solids:** | 86.2 |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 4G68956.D | 1 | 06/07/16 | KD | 06/01/16 | OP94393 | G4G1813 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 15.7 g | 10.0 ml |
| Run #2 | | |

**Pesticide TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 309-00-2 | Aldrin | ND | 0.74 | 0.66 | ug/kg | |
| 319-84-6 | alpha-BHC | ND | 0.74 | 0.49 | ug/kg | |
| 319-85-7 | beta-BHC | ND | 0.74 | 0.46 | ug/kg | |
| 319-86-8 | delta-BHC | ND | 0.74 | 0.29 | ug/kg | |
| 58-89-9 | gamma-BHC (Lindane) | ND | 0.74 | 0.34 | ug/kg | |
| 5103-71-9 | alpha-Chlordane | ND | 0.74 | 0.39 | ug/kg | |
| 5103-74-2 | gamma-Chlordane | ND | 0.74 | 0.56 | ug/kg | |
| 60-57-1 | Dieldrin | ND | 0.74 | 0.58 | ug/kg | |
| 72-54-8 | 4,4'-DDD | ND | 0.74 | 0.27 | ug/kg | |
| 72-55-9 | 4,4'-DDE | ND | 0.74 | 0.25 | ug/kg | |
| 50-29-3 | 4,4'-DDT | ND | 0.74 | 0.28 | ug/kg | |
| 72-20-8 | Endrin | ND | 0.74 | 0.26 | ug/kg | |
| 1031-07-8 | Endosulfan sulfate | ND | 0.74 | 0.42 | ug/kg | |
| 7421-93-4 | Endrin aldehyde | ND | 0.74 | 0.55 | ug/kg | |
| 959-98-8 | Endosulfan-I | ND | 0.74 | 0.24 | ug/kg | |
| 33213-65-9 | Endosulfan-II | ND | 0.74 | 0.70 | ug/kg | |
| 76-44-8 | Heptachlor | ND | 0.74 | 0.61 | ug/kg | |
| 1024-57-3 | Heptachlor epoxide | ND | 0.74 | 0.31 | ug/kg | |
| 72-43-5 | Methoxychlor | ND | 1.5 | 0.41 | ug/kg | |
| 53494-70-5 | Endrin ketone | ND | 0.74 | 0.39 | ug/kg | |
| 8001-35-2 | Toxaphene | ND | 18 | 13 | ug/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 877-09-8 | Tetrachloro-m-xylene | 87% | | 24-136% |
| 877-09-8 | Tetrachloro-m-xylene | 78% | | 24-136% |
| 2051-24-3 | Decachlorobiphenyl | 98% | | 10-153% |
| 2051-24-3 | Decachlorobiphenyl | 89% | | 10-153% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102-GWD | | |
| **Lab Sample ID:** | JC21229-3 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 6P26494.D | 1 | 05/31/16 | AC | 05/29/16 | OP94328 | E6P1232 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1000 ml | 1.0 ml |
| Run #2 | | |

**ABN TCL Special List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 95-57-8 | 2-Chlorophenol | ND | 5.0 | 0.82 | ug/l | |
| 59-50-7 | 4-Chloro-3-methyl phenol | ND | 5.0 | 0.89 | ug/l | |
| 120-83-2 | 2,4-Dichlorophenol | ND | 2.0 | 1.3 | ug/l | |
| 105-67-9 | 2,4-Dimethylphenol | ND | 5.0 | 2.4 | ug/l | |
| 51-28-5 | 2,4-Dinitrophenol | ND | 10 | 1.6 | ug/l | |
| 534-52-1 | 4,6-Dinitro-o-cresol | ND | 5.0 | 1.3 | ug/l | |
| 95-48-7 | 2-Methylphenol | ND | 2.0 | 0.89 | ug/l | |
| | 3&4-Methylphenol | ND | 2.0 | 0.88 | ug/l | |
| 88-75-5 | 2-Nitrophenol | ND | 5.0 | 0.96 | ug/l | |
| 100-02-7 | 4-Nitrophenol | ND | 10 | 1.2 | ug/l | |
| 87-86-5 | Pentachlorophenol | ND | 5.0 | 1.4 | ug/l | |
| 108-95-2 | Phenol | ND | 2.0 | 0.39 | ug/l | |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | ND | 5.0 | 1.5 | ug/l | |
| 95-95-4 | 2,4,5-Trichlorophenol | ND | 5.0 | 1.3 | ug/l | |
| 88-06-2 | 2,4,6-Trichlorophenol | ND | 5.0 | 0.92 | ug/l | |
| 83-32-9 | Acenaphthene | ND | 1.0 | 0.19 | ug/l | |
| 208-96-8 | Acenaphthylene | ND | 1.0 | 0.14 | ug/l | |
| 98-86-2 | Acetophenone | ND | 2.0 | 0.21 | ug/l | |
| 120-12-7 | Anthracene | ND | 1.0 | 0.21 | ug/l | |
| 1912-24-9 | Atrazine | ND | 2.0 | 0.45 | ug/l | |
| 100-52-7 | Benzaldehyde | ND | 5.0 | 0.29 | ug/l | |
| 56-55-3 | Benzo(a)anthracene | ND | 1.0 | 0.20 | ug/l | |
| 50-32-8 | Benzo(a)pyrene | ND | 1.0 | 0.21 | ug/l | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 1.0 | 0.21 | ug/l | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 1.0 | 0.34 | ug/l | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 1.0 | 0.21 | ug/l | |
| 101-55-3 | 4-Bromophenyl phenyl ether | ND | 2.0 | 0.40 | ug/l | |
| 85-68-7 | Butyl benzyl phthalate | ND | 2.0 | 0.46 | ug/l | |
| 92-52-4 | 1,1'-Biphenyl | ND | 1.0 | 0.21 | ug/l | |
| 91-58-7 | 2-Chloronaphthalene | ND | 2.0 | 0.24 | ug/l | |
| 106-47-8 | 4-Chloroaniline | ND | 5.0 | 0.34 | ug/l | |
| 86-74-8 | Carbazole | ND | 1.0 | 0.23 | ug/l | |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102-GWD | | |
| **Lab Sample ID:** | JC21229-3 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

**ABN TCL Special List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 105-60-2 | Caprolactam | ND | 2.0 | 0.65 | ug/l | |
| 218-01-9 | Chrysene | ND | 1.0 | 0.18 | ug/l | |
| 111-91-1 | bis(2-Chloroethoxy)methane | ND | 2.0 | 0.28 | ug/l | |
| 111-44-4 | bis(2-Chloroethyl)ether | ND | 2.0 | 0.25 | ug/l | |
| 108-60-1 | bis(2-Chloroisopropyl)ether | ND | 2.0 | 0.40 | ug/l | |
| 7005-72-3 | 4-Chlorophenyl phenyl ether | ND | 2.0 | 0.37 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | ND | 1.0 | 0.55 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | ND | 1.0 | 0.48 | ug/l | |
| 91-94-1 | 3,3'-Dichlorobenzidine | ND | 2.0 | 0.51 | ug/l | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 1.0 | 0.33 | ug/l | |
| 132-64-9 | Dibenzofuran | ND | 5.0 | 0.22 | ug/l | |
| 84-74-2 | Di-n-butyl phthalate | ND | 2.0 | 0.50 | ug/l | |
| 117-84-0 | Di-n-octyl phthalate | ND | 2.0 | 0.23 | ug/l | |
| 84-66-2 | Diethyl phthalate | ND | 2.0 | 0.26 | ug/l | |
| 131-11-3 | Dimethyl phthalate | ND | 2.0 | 0.22 | ug/l | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | ND | 2.0 | 1.7 | ug/l | |
| 206-44-0 | Fluoranthene | ND | 1.0 | 0.17 | ug/l | |
| 86-73-7 | Fluorene | ND | 1.0 | 0.17 | ug/l | |
| 118-74-1 | Hexachlorobenzene | ND | 1.0 | 0.33 | ug/l | |
| 87-68-3 | Hexachlorobutadiene | ND | 1.0 | 0.49 | ug/l | |
| 77-47-4 | Hexachlorocyclopentadiene | ND | 10 | 2.8 | ug/l | |
| 67-72-1 | Hexachloroethane | ND | 2.0 | 0.39 | ug/l | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 1.0 | 0.33 | ug/l | |
| 78-59-1 | Isophorone | ND | 2.0 | 0.28 | ug/l | |
| 90-12-0 | 1-Methylnaphthalene | ND | 1.0 | 0.26 | ug/l | |
| 91-57-6 | 2-Methylnaphthalene | ND | 1.0 | 0.21 | ug/l | |
| 88-74-4 | 2-Nitroaniline | ND | 5.0 | 0.28 | ug/l | |
| 99-09-2 | 3-Nitroaniline | ND | 5.0 | 0.39 | ug/l | |
| 100-01-6 | 4-Nitroaniline | ND | 5.0 | 0.44 | ug/l | |
| 98-95-3 | Nitrobenzene | ND | 2.0 | 0.64 | ug/l | |
| 621-64-7 | N-Nitroso-di-n-propylamine | ND | 2.0 | 0.48 | ug/l | |
| 86-30-6 | N-Nitrosodiphenylamine | ND | 5.0 | 0.22 | ug/l | |
| 85-01-8 | Phenanthrene | ND | 1.0 | 0.18 | ug/l | |
| 129-00-0 | Pyrene | ND | 1.0 | 0.22 | ug/l | |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | ND | 2.0 | 0.37 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 367-12-4 | 2-Fluorophenol | 26% | | 14-88% |
| 4165-62-2 | Phenol-d5 | 22% | | 10-110% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

# Report of Analysis



| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102-GWD | | |
| **Lab Sample ID:** | JC21229-3 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

**ABN TCL Special List**

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 118-79-6 | 2,4,6-Tribromophenol | 66% | | 39-149% |
| 4165-60-0 | Nitrobenzene-d5 | 71% | | 32-128% |
| 321-60-8 | 2-Fluorobiphenyl | 72% | | 35-119% |
| 1718-51-0 | Terphenyl-d14 | 71% | | 10-126% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102-GWD | | |
| **Lab Sample ID:** | JC21229-3 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D BY SIM SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 3M61859.D | 1 | 06/02/16 | JJ | 05/29/16 | OP94328A | E3M2915 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1000 ml | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 91-20-3 | Naphthalene | ND | 0.10 | 0.029 | ug/l | |
| 123-91-1 | 1,4-Dioxane | 0.690 | 0.10 | 0.049 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 65% | | 24-125% |
| 321-60-8 | 2-Fluorobiphenyl | 76% | | 19-127% |
| 1718-51-0 | Terphenyl-d14 | 74% | | 10-119% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102-GWD | | |
| **Lab Sample ID:** | JC21229-3 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 05/28/16 |
| **Method:** | SW846-8015C (DAI) | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | GH105308.D | 1 | 06/01/16 | XPL | n/a | n/a | GGH5307 |
| Run #2 | | | | | | | |

**Low Molecular Alcohol List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 64-17-5 | Ethanol | ND | 100 | 55 | ug/l | |
| 78-83-1 | Isobutyl Alcohol | ND | 100 | 36 | ug/l | |
| 67-63-0 | Isopropyl Alcohol | ND | 100 | 68 | ug/l | |
| 71-23-8 | n-Propyl Alcohol | ND | 100 | 43 | ug/l | |
| 71-36-3 | n-Butyl Alcohol | ND | 100 | 87 | ug/l | |
| 78-92-2 | sec-Butyl Alcohol | ND | 100 | 66 | ug/l | |
| 67-56-1 | Methanol | ND | 200 | 71 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 111-27-3 | Hexanol | 69% | | 56-145% |
| 111-27-3 | Hexanol | 71% | | 56-145% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 1G123741.D 1G123821.D

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | SB102-GWD | | |
| **Lab Sample ID:** | JC21229-3 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Ground Water | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8081B SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 1G123741.D | 1 | 06/01/16 | KD | 05/29/16 | OP94349 | G1G4001 |
| Run #2 [a] | 1G123821.D | 1 | 06/03/16 | KD | 06/02/16 | OP94431 | G1G4003 |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 980 ml | 10.0 ml |
| Run #2 | 920 ml | 10.0 ml |

**Pesticide TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 309-00-2 | Aldrin | ND | 0.010 | 0.0062 | ug/l | |
| 319-84-6 | alpha-BHC | ND | 0.010 | 0.0061 | ug/l | |
| 319-85-7 | beta-BHC | ND | 0.010 | 0.0058 | ug/l | |
| 319-86-8 | delta-BHC | ND | 0.010 | 0.0047 | ug/l | |
| 58-89-9 | gamma-BHC (Lindane) | ND | 0.010 | 0.0028 | ug/l | |
| 5103-71-9 | alpha-Chlordane | ND | 0.010 | 0.0047 | ug/l | |
| 5103-74-2 | gamma-Chlordane | ND | 0.010 | 0.0047 | ug/l | |
| 60-57-1 | Dieldrin | ND | 0.010 | 0.0037 | ug/l | |
| 72-54-8 | 4,4'-DDD | ND | 0.010 | 0.0039 | ug/l | |
| 72-55-9 | 4,4'-DDE | ND | 0.010 | 0.0063 | ug/l | |
| 50-29-3 | 4,4'-DDT | ND | 0.010 | 0.0051 | ug/l | |
| 72-20-8 | Endrin | ND | 0.010 | 0.0051 | ug/l | |
| 1031-07-8 | Endosulfan sulfate | ND | 0.010 | 0.0054 | ug/l | |
| 7421-93-4 | Endrin aldehyde | ND | 0.010 | 0.0052 | ug/l | |
| 53494-70-5 | Endrin ketone | ND | 0.010 | 0.0052 | ug/l | |
| 959-98-8 | Endosulfan-I | ND | 0.010 | 0.0051 | ug/l | |
| 33213-65-9 | Endosulfan-II | ND | 0.010 | 0.0044 | ug/l | |
| 76-44-8 | Heptachlor | ND | 0.010 | 0.0039 | ug/l | |
| 1024-57-3 | Heptachlor epoxide | ND | 0.010 | 0.0067 | ug/l | |
| 72-43-5 | Methoxychlor | ND | 0.020 | 0.0058 | ug/l | |
| 8001-35-2 | Toxaphene | ND | 0.26 | 0.19 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 877-09-8 | Tetrachloro-m-xylene | 117% | 91% | 26-132% |
| 877-09-8 | Tetrachloro-m-xylene | 117% | 88% | 26-132% |
| 2051-24-3 | Decachlorobiphenyl | 69% | 46% | 10-118% |
| 2051-24-3 | Decachlorobiphenyl | 81% | 52% | 10-118% |

(a) Confirmation run.


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BPEB-30 | | |
| **Lab Sample ID:** | JC21229-4 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Equipment Blank | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 6P26495.D | 1 | 05/31/16 | AC | 05/29/16 | OP94328 | E6P1232 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1000 ml | 1.0 ml |
| Run #2 | | |

**ABN TCL Special List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 95-57-8 | 2-Chlorophenol | ND | 5.0 | 0.82 | ug/l | |
| 59-50-7 | 4-Chloro-3-methyl phenol | ND | 5.0 | 0.89 | ug/l | |
| 120-83-2 | 2,4-Dichlorophenol | ND | 2.0 | 1.3 | ug/l | |
| 105-67-9 | 2,4-Dimethylphenol | ND | 5.0 | 2.4 | ug/l | |
| 51-28-5 | 2,4-Dinitrophenol | ND | 10 | 1.6 | ug/l | |
| 534-52-1 | 4,6-Dinitro-o-cresol | ND | 5.0 | 1.3 | ug/l | |
| 95-48-7 | 2-Methylphenol | ND | 2.0 | 0.89 | ug/l | |
| | 3&4-Methylphenol | ND | 2.0 | 0.88 | ug/l | |
| 88-75-5 | 2-Nitrophenol | ND | 5.0 | 0.96 | ug/l | |
| 100-02-7 | 4-Nitrophenol | ND | 10 | 1.2 | ug/l | |
| 87-86-5 | Pentachlorophenol | ND | 5.0 | 1.4 | ug/l | |
| 108-95-2 | Phenol | ND | 2.0 | 0.39 | ug/l | |
| 58-90-2 | 2,3,4,6-Tetrachlorophenol | ND | 5.0 | 1.5 | ug/l | |
| 95-95-4 | 2,4,5-Trichlorophenol | ND | 5.0 | 1.3 | ug/l | |
| 88-06-2 | 2,4,6-Trichlorophenol | ND | 5.0 | 0.92 | ug/l | |
| 83-32-9 | Acenaphthene | ND | 1.0 | 0.19 | ug/l | |
| 208-96-8 | Acenaphthylene | ND | 1.0 | 0.14 | ug/l | |
| 98-86-2 | Acetophenone | ND | 2.0 | 0.21 | ug/l | |
| 120-12-7 | Anthracene | ND | 1.0 | 0.21 | ug/l | |
| 1912-24-9 | Atrazine | ND | 2.0 | 0.45 | ug/l | |
| 100-52-7 | Benzaldehyde | ND | 5.0 | 0.29 | ug/l | |
| 56-55-3 | Benzo(a)anthracene | ND | 1.0 | 0.20 | ug/l | |
| 50-32-8 | Benzo(a)pyrene | ND | 1.0 | 0.21 | ug/l | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 1.0 | 0.21 | ug/l | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 1.0 | 0.34 | ug/l | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 1.0 | 0.21 | ug/l | |
| 101-55-3 | 4-Bromophenyl phenyl ether | ND | 2.0 | 0.40 | ug/l | |
| 85-68-7 | Butyl benzyl phthalate | ND | 2.0 | 0.46 | ug/l | |
| 92-52-4 | 1,1'-Biphenyl | ND | 1.0 | 0.21 | ug/l | |
| 91-58-7 | 2-Chloronaphthalene | ND | 2.0 | 0.24 | ug/l | |
| 106-47-8 | 4-Chloroaniline | ND | 5.0 | 0.34 | ug/l | |
| 86-74-8 | Carbazole | ND | 1.0 | 0.23 | ug/l | |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BPEB-30 | | |
| **Lab Sample ID:** | JC21229-4 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Equipment Blank | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

**ABN TCL Special List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 105-60-2 | Caprolactam | ND | 2.0 | 0.65 | ug/l | |
| 218-01-9 | Chrysene | ND | 1.0 | 0.18 | ug/l | |
| 111-91-1 | bis(2-Chloroethoxy)methane | ND | 2.0 | 0.28 | ug/l | |
| 111-44-4 | bis(2-Chloroethyl)ether | ND | 2.0 | 0.25 | ug/l | |
| 108-60-1 | bis(2-Chloroisopropyl)ether | ND | 2.0 | 0.40 | ug/l | |
| 7005-72-3 | 4-Chlorophenyl phenyl ether | ND | 2.0 | 0.37 | ug/l | |
| 121-14-2 | 2,4-Dinitrotoluene | ND | 1.0 | 0.55 | ug/l | |
| 606-20-2 | 2,6-Dinitrotoluene | ND | 1.0 | 0.48 | ug/l | |
| 91-94-1 | 3,3'-Dichlorobenzidine | ND | 2.0 | 0.51 | ug/l | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 1.0 | 0.33 | ug/l | |
| 132-64-9 | Dibenzofuran | ND | 5.0 | 0.22 | ug/l | |
| 84-74-2 | Di-n-butyl phthalate | ND | 2.0 | 0.50 | ug/l | |
| 117-84-0 | Di-n-octyl phthalate | ND | 2.0 | 0.23 | ug/l | |
| 84-66-2 | Diethyl phthalate | ND | 2.0 | 0.26 | ug/l | |
| 131-11-3 | Dimethyl phthalate | ND | 2.0 | 0.22 | ug/l | |
| 117-81-7 | bis(2-Ethylhexyl)phthalate | ND | 2.0 | 1.7 | ug/l | |
| 206-44-0 | Fluoranthene | ND | 1.0 | 0.17 | ug/l | |
| 86-73-7 | Fluorene | ND | 1.0 | 0.17 | ug/l | |
| 118-74-1 | Hexachlorobenzene | ND | 1.0 | 0.33 | ug/l | |
| 87-68-3 | Hexachlorobutadiene | ND | 1.0 | 0.49 | ug/l | |
| 77-47-4 | Hexachlorocyclopentadiene | ND | 10 | 2.8 | ug/l | |
| 67-72-1 | Hexachloroethane | ND | 2.0 | 0.39 | ug/l | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 1.0 | 0.33 | ug/l | |
| 78-59-1 | Isophorone | ND | 2.0 | 0.28 | ug/l | |
| 90-12-0 | 1-Methylnaphthalene | ND | 1.0 | 0.26 | ug/l | |
| 91-57-6 | 2-Methylnaphthalene | ND | 1.0 | 0.21 | ug/l | |
| 88-74-4 | 2-Nitroaniline | ND | 5.0 | 0.28 | ug/l | |
| 99-09-2 | 3-Nitroaniline | ND | 5.0 | 0.39 | ug/l | |
| 100-01-6 | 4-Nitroaniline | ND | 5.0 | 0.44 | ug/l | |
| 98-95-3 | Nitrobenzene | ND | 2.0 | 0.64 | ug/l | |
| 621-64-7 | N-Nitroso-di-n-propylamine | ND | 2.0 | 0.48 | ug/l | |
| 86-30-6 | N-Nitrosodiphenylamine | ND | 5.0 | 0.22 | ug/l | |
| 85-01-8 | Phenanthrene | ND | 1.0 | 0.18 | ug/l | |
| 129-00-0 | Pyrene | ND | 1.0 | 0.22 | ug/l | |
| 95-94-3 | 1,2,4,5-Tetrachlorobenzene | ND | 2.0 | 0.37 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 367-12-4 | 2-Fluorophenol | 32% | | 14-88% |
| 4165-62-2 | Phenol-d5 | 19% | | 10-110% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BPEB-30 | | |
| **Lab Sample ID:** | JC21229-4 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Equipment Blank | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

**ABN TCL Special List**

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 118-79-6 | 2,4,6-Tribromophenol | 73% | | 39-149% |
| 4165-60-0 | Nitrobenzene-d5 | 81% | | 32-128% |
| 321-60-8 | 2-Fluorobiphenyl | 83% | | 35-119% |
| 1718-51-0 | Terphenyl-d14 | 85% | | 10-126% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BPEB-30 | | |
| **Lab Sample ID:** | JC21229-4 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Equipment Blank | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8270D BY SIM SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 3M61860.D | 1 | 06/02/16 | JJ | 05/29/16 | OP94328A | E3M2915 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 1000 ml | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 91-20-3 | Naphthalene | ND | 0.10 | 0.029 | ug/l | |
| 123-91-1 | 1,4-Dioxane | ND | 0.10 | 0.049 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 71% | | 24-125% |
| 321-60-8 | 2-Fluorobiphenyl | 93% | | 19-127% |
| 1718-51-0 | Terphenyl-d14 | 84% | | 10-119% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BPEB-30 | | |
| **Lab Sample ID:** | JC21229-4 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Equipment Blank | **Date Received:** | 05/28/16 |
| **Method:** | SW846-8015C (DAI) | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | GH105309.D | 1 | 06/01/16 | XPL | n/a | n/a | GGH5307 |
| Run #2 | | | | | | | |

**Low Molecular Alcohol List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 64-17-5 | Ethanol | ND | 100 | 55 | ug/l | |
| 78-83-1 | Isobutyl Alcohol | ND | 100 | 36 | ug/l | |
| 67-63-0 | Isopropyl Alcohol | ND | 100 | 68 | ug/l | |
| 71-23-8 | n-Propyl Alcohol | ND | 100 | 43 | ug/l | |
| 71-36-3 | n-Butyl Alcohol | ND | 100 | 87 | ug/l | |
| 78-92-2 | sec-Butyl Alcohol | ND | 100 | 66 | ug/l | |
| 67-56-1 | Methanol | ND | 200 | 71 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 111-27-3 | Hexanol | 76% | | 56-145% |
| 111-27-3 | Hexanol | 76% | | 56-145% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 1G123826.D

SGS Accutest

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BPEB-30 | | |
| **Lab Sample ID:** | JC21229-4 | **Date Sampled:** | 05/27/16 |
| **Matrix:** | AQ - Equipment Blank | **Date Received:** | 05/28/16 |
| **Method:** | SW846 8081B SW846 3510C | **Percent Solids:** | n/a |
| **Project:** | BMSMC, Building 5 Area, PR | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | 1G123826.D | 1 | 06/03/16 | KD | 06/02/16 | OP94431 | G1G4003 |
| Run #2 | | | | | | | |

| | Initial Volume | Final Volume |
|---|---|---|
| Run #1 | 890 ml | 10.0 ml |
| Run #2 | | |

**Pesticide TCL List**

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---|---|---|---|---|---|---|
| 309-00-2 | Aldrin | ND | 0.011 | 0.0068 | ug/l | |
| 319-84-6 | alpha-BHC | ND | 0.011 | 0.0067 | ug/l | |
| 319-85-7 | beta-BHC | ND | 0.011 | 0.0064 | ug/l | |
| 319-86-8 | delta-BHC | ND | 0.011 | 0.0051 | ug/l | |
| 58-89-9 | gamma-BHC (Lindane) | ND | 0.011 | 0.0031 | ug/l | |
| 5103-71-9 | alpha-Chlordane | ND | 0.011 | 0.0052 | ug/l | |
| 5103-74-2 | gamma-Chlordane | ND | 0.011 | 0.0052 | ug/l | |
| 60-57-1 | Dieldrin | ND | 0.011 | 0.0040 | ug/l | |
| 72-54-8 | 4,4'-DDD | ND | 0.011 | 0.0043 | ug/l | |
| 72-55-9 | 4,4'-DDE | ND | 0.011 | 0.0069 | ug/l | |
| 50-29-3 | 4,4'-DDT | ND | 0.011 | 0.0056 | ug/l | |
| 72-20-8 | Endrin | ND | 0.011 | 0.0057 | ug/l | |
| 1031-07-8 | Endosulfan sulfate | ND | 0.011 | 0.0059 | ug/l | |
| 7421-93-4 | Endrin aldehyde | ND | 0.011 | 0.0058 | ug/l | |
| 53494-70-5 | Endrin ketone | ND | 0.011 | 0.0057 | ug/l | |
| 959-98-8 | Endosulfan-I | ND | 0.011 | 0.0056 | ug/l | |
| 33213-65-9 | Endosulfan-II | ND | 0.011 | 0.0048 | ug/l | |
| 76-44-8 | Heptachlor | ND | 0.011 | 0.0043 | ug/l | |
| 1024-57-3 | Heptachlor epoxide | ND | 0.011 | 0.0073 | ug/l | |
| 72-43-5 | Methoxychlor | ND | 0.022 | 0.0064 | ug/l | |
| 8001-35-2 | Toxaphene | ND | 0.28 | 0.21 | ug/l | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 877-09-8 | Tetrachloro-m-xylene | 100% | | 26-132% |
| 877-09-8 | Tetrachloro-m-xylene | 89% | | 26-132% |
| 2051-24-3 | Decachlorobiphenyl | 50% | | 10-118% |
| 2051-24-3 | Decachlorobiphenyl | 54% | | 10-118% |


ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS ACCUTEST — SO, GW, WEB, NJ

# CHAIN OF CUSTODY

SGS Accutest - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX. 732-329-3499/3480
www.accutest.com

PAGE 1 OF 1

801219535905

SGS Accutest Quote #

SGS Accutest Job # JC21229

| | |
|---|---|
| Company Name: Anderson Midland Assoc. Inc | Project Name: BMS Release Assessment |
| Street Address: 2700 Westchester | Street: |
| City / State / Zip: Purchase NY | City: Humacao PR |
| Project Contact: Terry Taylor | Project #: |
| Phone #: 914-251-0400 | Client Purchase Order #: |
| Sampler(s) Name(s): N. Rivera, T. Taylor, D. Lindstrom | Project Manager: |

Billing Information (if different from Report to):
Company Name:
Street Address:
City / State / Zip:
Attention:

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

| SGS Accutest Sample # | Field ID / Point of Collection | MEOH Vial # | Collection Date | Collection Time | Sampled By | Matrix | # of bottles | HCl | NaOH | H2SO4 | HNO3 | DI Water | MEOH | ENCORE | SVOC - Method 8270D | LMW - Method 8015B | Pesticides - Method 8081B | 1,4 Dioxane + Naphthalene by Method 8270D SIM | | | | | | | | | | | | | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SB102 (5.5-6.5) | | 05/27/16 | 1030 | TT | SO | | | | | 2 | | | | X | X | X | X | | | | | | | | | | | | | E39 |
| 2 | SB102 (7-8) | | 05/27/16 | 1055 | TT | SO | | | | | 2 | | | | X | X | X | X | | | | | | | | | | | | | V05 4 |
| 3 | SB102-GWD | | 05/27/16 | 1240 | TT | GW | 6 | 3 | | | 3 | | | | X | X | X | X | | | | | | | | | | | | | D23 |
| 4 | BPEB-30 | | 05/27/16 | 1400 | TT | EB | 6 | 3 | | | 3 | | | | X | X | X | X | | | | | | | | | | | | | C3a TI |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 34 HK |

INITIAL ASSESSMENT 2A 05/28/16
LABEL VERIFICATION DK

Turnaround Time (Business days)

- [X] Std. 10 Business Days For soil samples
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [X] 1 Day RUSH For aqueous samples
- [ ] other

Approved By (SGS Accutest PM) / Date:

Emergency & Rush T/A data available VIA Labtrack

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [X] FULL T1 (Level 3+4)
- [X] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only, Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Add to Report: 1-methyl naphthalene with SVOC Method 8270D

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

| | Relinquished by: | Date Time: | Received By: | Relinquished By: | Date Time: | Received By: |
|---|---|---|---|---|---|---|
| 1 | [signature] | 05/27/16 2000 | 1 Fed Ex | 2 Fed Ex | 5/28/16 1000 | |
| 3 | | | 3 | 4 | | 4 |
| 5 | | | 5 | | | |

Cooler Temp: 3.6 / 4.7C

## EXECUTIVE NARRATIVE

| | | | |
|---|---|---|---|
| SDG No: | JC21229 | Laboratory: | Accutest, New Jersey |
| Analysis: | SW846-8270D | Number of Samples: | 4 |
| Location: | BMSMC, Building 5 Area<br>Humacao, PR | | |

SUMMARY: Four (4) samples were analyzed for the ABN TCL list following method SW846-8270D; Naphthalene and 1,4-Dioxane were also analyzed by SW846-8270D using the selective ion monitoring (SIM) technique. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. Semivolatile Data Validation. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

**Critical issues:** **None**
**Major:** **None**
**Minor:** **None**

**Critical findings:** **None**
**Major findings:** **None**
**Minor findings:**

**1.** Initial and continuing calibration verifications meet the required criteria. Analytes not meeting the method % difference criteria meet the guidance document performance criteria for continuing calibration verification of $\pm$ 25 or 40 %, no action taken.

Analytes not meeting the % difference continuing calibration criteria were qualified as estimated (J) or (UJ) in affected samples.

No closing calibration verification included in data package. No action taken, professional judgment.

**2.** MS/MSD % recoveries and RPD outside the in-house limits for several analytes in the MS/MSD QC sample for this sample batch. No action taken, MS/MSD results apply to unspiked sample. Unspiked samples were from another project.

MS/MSD % recoveries for 1,4-dioxane in sample JC21229-1MS/MSD was outside the lower laboratory control limit. 1,4-dioxane not detected in sample JC21229-1. Results are qualified as (R).

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: June 22, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC21229-1
Sample location: BMSMC Building 5 Area
Sampling date: 5/27/2016
Matrix: Soil

METHOD: 8270D

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| 2-Chlorophenol | 84 | ug/kg | 1 | - | U | Yes |
| 4-Chloro-3-methyl phenol | 210 | ug/kg | 1 | - | U | Yes |
| 2,4-Dichlorophenol | 210 | ug/kg | 1 | - | U | Yes |
| 2,4-Dimethylphenol | 210 | ug/kg | 1 | - | U | Yes |
| 2,4-Dinitrophenol | 210 | ug/kg | 1 | - | U | Yes |
| 4,6-Dinitro-o-cresol | 210 | ug/kg | 1 | - | U | Yes |
| 2-Methylphenol | 84 | ug/kg | 1 | - | U | Yes |
| 3&4-Methylphenol | 84 | ug/kg | 1 | - | U | Yes |
| 2-Nitrophenol | 210 | ug/kg | 1 | - | U | Yes |
| 4-Nitrophenol | 420 | ug/kg | 1 | - | U | Yes |
| Pentachlorophenol | 210 | ug/kg | 1 | - | U | Yes |
| Phenol | 84 | ug/kg | 1 | - | UJ | Yes |
| 2,3,4,6-Tetrachlorophenol | 210 | ug/kg | 1 | - | U | Yes |
| 2,4,5-Trichlorophenol | 210 | ug/kg | 1 | - | U | Yes |
| 2,4,6-Trichlorophenol | 210 | ug/kg | 1 | - | U | Yes |
| Acenaphthene | 42 | ug/kg | 1 | - | U | Yes |
| Acenaphthylene | 42 | ug/kg | 1 | - | U | Yes |
| Acetophenone | 210 | ug/kg | 1 | - | U | Yes |
| Anthracene | 42 | ug/kg | 1 | - | U | Yes |
| Atrazine | 84 | ug/kg | 1 | - | U | Yes |
| Benzo(a)anthracene | 17.2 | ug/kg | 1 | J | UJ | Yes |
| Benzo(a)pyrene | 42 | ug/kg | 1 | - | U | Yes |
| Benzo(b)fluoranthene | 42 | ug/kg | 1 | - | U | Yes |
| Benzo(g,h,i)perylene | 42 | ug/kg | 1 | - | U | Yes |
| Benzo(k)fluoranthene | 42 | ug/kg | 1 | - | U | Yes |
| 4-Bromophenyl phenyl ether | 84 | ug/kg | 1 | - | U | Yes |
| Butyl benzyl phthalate | 84 | ug/kg | 1 | - | U | Yes |
| 1,1'-Biphenyl | 84 | ug/kg | 1 | - | U | Yes |
| Benzaldehyde | 210 | ug/kg | 1 | - | U | Yes |
| 2-Chloronaphthalene | 84 | ug/kg | 1 | - | U | Yes |
| 4-Chloroaniline | 210 | ug/kg | 1 | - | U | Yes |
| Carbazole | 84 | ug/kg | 1 | - | U | Yes |
| Caprolactam | 84 | ug/kg | 1 | - | U | Yes |
| Chrysene | 42 | ug/kg | 1 | - | U | Yes |
| bis(2-Chloroethoxy)methane | 84 | ug/kg | 1 | - | U | Yes |
| bis(2-Chloroethyl)ether | 84 | ug/kg | 1 | - | UJ | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| bis(2-Chloroisopropyl)ether | 84 | ug/kg | 1 | - | U | Yes |
| 4-Chlorophenyl phenyl ether | 84 | ug/kg | 1 | - | U | Yes |
| 2,4-Dinitrotoluene | 42 | ug/kg | 1 | - | U | Yes |
| 2,6-Dinitrotoluene | 42 | ug/kg | 1 | - | U | Yes |
| 3,3'-Dichlorobenzidine | 84 | ug/kg | 1 | - | U | Yes |
| Dibenzo(a,h)anthracene | 42 | ug/kg | 1 | - | U | Yes |
| Dibenzofuran | 84 | ug/kg | 1 | - | U | Yes |
| Di-n-butyl phthalate | 84 | ug/kg | 1 | - | U | Yes |
| Di-n-octyl phthalate | 84 | ug/kg | 1 | - | U | Yes |
| Diethyl phthalate | 84 | ug/kg | 1 | - | U | Yes |
| Dimethyl phthalate | 84 | ug/kg | 1 | - | U | Yes |
| bis(2-Ethylhexyl)phthalate | 42 | ug/kg | 1 | - | U | Yes |
| Fluoranthene | 48.5 | ug/kg | 1 | - | - | Yes |
| Fluorene | 42 | ug/kg | 1 | - | U | Yes |
| Hexachlorobenzene | 84 | ug/kg | 1 | - | U | Yes |
| Hexachlorobutadiene | 42 | ug/kg | 1 | - | U | Yes |
| Hexachlorocyclopentadiene | 420 | ug/kg | 1 | - | UJ | Yes |
| Hexachloroethane | 210 | ug/kg | 1 | - | U | Yes |
| Indeno(1,2,3-cd)pyrene | 42 | ug/kg | 1 | - | U | Yes |
| Isophorone | 84 | ug/kg | 1 | - | U | Yes |
| 1-Methylnaphthalene | 84 | ug/kg | 1 | - | U | Yes |
| 2-Methylnaphthalene | 84 | ug/kg | 1 | - | U | Yes |
| 2-Nitroaniline | 210 | ug/kg | 1 | - | UJ | Yes |
| 3-Nitroaniline | 210 | ug/kg | 1 | - | U | Yes |
| 4-Nitroaniline | 210 | ug/kg | 1 | - | U | Yes |
| Nitrobenzene | 84 | ug/kg | 1 | - | U | Yes |
| N-Nitroso-di-n-propylamine | 84 | ug/kg | 1 | - | U | Yes |
| Nitrosodiphenylamine | 210 | ug/kg | 1 | - | U | Yes |
| Phenanthrene | 27.0 | ug/kg | 1 | J | UJ | Yes |
| Pyrene | 40.0 | ug/kg | 1 | J | UJ | Yes |
| 1,2,4,5-Tetrachlorobenzene | 210 | ug/l | 1 | - | U | Yes |
| METHOD: 8270D (SIM) | | | | | | |
| Naphthalene | 4.2 | ug/kg | 1 | - | U | Yes |
| 1,4-Dioxane | 4.2 | ug/kg | 1 | - | R | Yes |

Sample ID: JC21229-2
Sample location: BMSMC Building 5 Area
Sampling date: 5/25/2016
Matrix: AQ - Equipment Blank

METHOD: 8270D

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| 2-Chlorophenol | 150 | ug/kg | 1 | - | U | Yes |
| 4-Chloro-3-methyl phenol | 380 | ug/kg | 1 | - | U | Yes |
| 2,4-Dichlorophenol | 380 | ug/kg | 1 | - | U | Yes |
| 2,4-Dimethylphenol | 380 | ug/kg | 1 | - | U | Yes |
| 2,4-Dinitrophenol | 380 | ug/kg | 1 | - | U | Yes |
| 4,6-Dinitro-o-cresol | 380 | ug/kg | 1 | - | U | Yes |
| 2-Methylphenol | 150 | ug/kg | 1 | - | U | Yes |
| 3&4-Methylphenol | 150 | ug/kg | 1 | - | U | Yes |
| 2-Nitrophenol | 380 | ug/kg | 1 | - | U | Yes |
| 4-Nitrophenol | 770 | ug/kg | 1 | - | U | Yes |
| Pentachlorophenol | 380 | ug/kg | 1 | - | U | Yes |
| Phenol | 150 | ug/kg | 1 | - | U | Yes |
| 2,3,4,6-Tetrachlorophenol | 380 | ug/kg | 1 | - | U | Yes |
| 2,4,5-Trichlorophenol | 380 | ug/kg | 1 | - | U | Yes |
| 2,4,6-Trichlorophenol | 380 | ug/kg | 1 | - | U | Yes |
| Acenaphthene | 77 | ug/kg | 1 | - | U | Yes |
| Acenaphthylene | 77 | ug/kg | 1 | - | U | Yes |
| Acetophenone | 380 | ug/kg | 1 | - | U | Yes |
| Anthracene | 77 | ug/kg | 1 | - | U | Yes |
| Atrazine | 150 | ug/kg | 1 | - | U | Yes |
| Benzo(a)anthracene | 92.5 | ug/kg | 1 | - | - | Yes |
| Benzo(a)pyrene | 51.5 | ug/kg | 1 | J | UJ | Yes |
| Benzo(b)fluoranthene | 64.5 | ug/kg | 1 | J | UJ | Yes |
| Benzo(g,h,i)perylene | 77 | ug/kg | 1 | - | U | Yes |
| Benzo(k)fluoranthene | 77 | ug/kg | 1 | - | U | Yes |
| 4-Bromophenyl phenyl ether | 150 | ug/kg | 1 | - | U | Yes |
| Butyl benzyl phthalate | 150 | ug/kg | 1 | - | U | Yes |
| 1,1'-Biphenyl | 150 | ug/kg | 1 | - | U | Yes |
| Benzaldehyde | 380 | ug/kg | 1 | - | U | Yes |
| 2-Chloronaphthalene | 150 | ug/kg | 1 | - | U | Yes |
| 4-Chloroaniline | 380 | ug/kg | 1 | - | U | Yes |
| Carbazole | 150 | ug/kg | 1 | - | U | Yes |
| Caprolactam | 150 | ug/kg | 1 | - | U | Yes |
| Chrysene | 41.2 | ug/kg | 1 | J | UJ | Yes |
| bis(2-Chloroethoxy)methane | 150 | ug/kg | 1 | - | U | Yes |
| bis(2-Chloroethyl)ether | 150 | ug/kg | 1 | - | U | Yes |
| bis(2-Chloroisopropyl)ether | 150 | ug/kg | 1 | - | U | Yes |
| 4-Chlorophenyl phenyl ether | 150 | ug/kg | 1 | - | U | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | 77 | ug/kg | 1 | - | U | Yes |
| 2,6-Dinitrotoluene | 77 | ug/kg | 1 | - | U | Yes |
| 3,3'-Dichlorobenzidine | 150 | ug/kg | 1 | - | U | Yes |
| Dibenzo(a,h)anthracene | 77 | ug/kg | 1 | - | U | Yes |
| Dibenzofuran | 150 | ug/kg | 1 | - | U | Yes |
| Di-n-butyl phthalate | 150 | ug/kg | 1 | - | U | Yes |
| Di-n-octyl phthalate | 150 | ug/kg | 1 | - | U | Yes |
| Diethyl phthalate | 150 | ug/kg | 1 | - | U | Yes |
| Dimethyl phthalate | 150 | ug/kg | 1 | - | U | Yes |
| bis(2-Ethylhexyl)phthalate | 150 | ug/kg | 1 | - | U | Yes |
| Fluoranthene | 77 | ug/kg | 1 | - | U | Yes |
| Fluorene | 77 | ug/kg | 1 | - | U | Yes |
| Hexachlorobenzene | 150 | ug/kg | 1 | - | U | Yes |
| Hexachlorobutadiene | 77 | ug/kg | 1 | - | U | Yes |
| Hexachlorocyclopentadiene | 770 | ug/kg | 1 | - | UJ | Yes |
| Hexachloroethane | 380 | ug/kg | 1 | - | U | Yes |
| Indeno(1,2,3-cd)pyrene | 77 | ug/kg | 1 | - | U | Yes |
| Isophorone | 150 | ug/kg | 1 | - | U | Yes |
| 1-Methylnaphthalene | 150 | ug/kg | 1 | - | U | Yes |
| 2-Methylnaphthalene | 150 | ug/kg | 1 | - | U | Yes |
| 2-Nitroaniline | 380 | ug/kg | 1 | - | UJ | Yes |
| 3-Nitroaniline | 380 | ug/kg | 1 | - | U | Yes |
| 4-Nitroaniline | 380 | ug/kg | 1 | - | U | Yes |
| Nitrobenzene | 150 | ug/kg | 1 | - | U | Yes |
| N-Nitroso-di-n-propylamine | 150 | ug/kg | 1 | - | U | Yes |
| Nitrosodiphenylamine | 380 | ug/kg | 1 | - | U | Yes |
| Phenanthrene | 77 | ug/kg | 1 | - | U | Yes |
| Pyrene | 71.7 | ug/kg | J | - | UJ | Yes |
| 1,2,4,5-Tetrachlorobenzene | 380 | ug/kg | 1 | - | U | Yes |
| METHOD: 8270D (SIM) | | | | | | |
| Naphthalene | 7.7 | ug/kg | 1 | - | U | Yes |
| 1,4-Dioxane | 7.7 | ug/kg | 1 | - | U | Yes |

Sample ID: JC21229-3
Sample location: BMSMC Building 5 Area
Sampling date: 5/27/2016
Matrix: Groundwater

METHOD: 8270D

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| 2-Chlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| 4-Chloro-3-methyl phenol | 5.0 | ug/l | 1 | - | U | Yes |
| 2,4-Dichlorophenol | 2.0 | ug/l | 1 | - | U | Yes |
| 2,4-Dimethylphenol | 5.0 | ug/l | 1 | - | U | Yes |
| 2,4-Dinitrophenol | 10 | ug/l | 1 | - | U | Yes |
| 4,6-Dinitro-o-cresol | 5.0 | ug/l | 1 | - | U | Yes |
| 2-Methylphenol | 2.0 | ug/l | 1 | - | U | Yes |
| 3&4-Methylphenol | 2.0 | ug/l | 1 | - | U | Yes |
| 2-Nitrophenol | 5.0 | ug/l | 1 | - | U | Yes |
| 4-Nitrophenol | 10 | ug/l | 1 | - | U | Yes |
| Pentachlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| Phenol | 2.0 | ug/l | 1 | - | U | Yes |
| 2,3,4,6-Tetrachlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| 2,4,5-Trichlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| 2,4,6-Trichlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| Acenaphthene | 1.0 | ug/l | 1 | - | U | Yes |
| Acenaphthylene | 1.0 | ug/l | 1 | - | U | Yes |
| Acetophenone | 2.0 | ug/l | 1 | - | U | Yes |
| Anthracene | 1.0 | ug/l | 1 | - | U | Yes |
| Atrazine | 2.0 | ug/l | 1 | - | U | Yes |
| Benzaldehyde | 5.0 | ug/l | 1 | - | U | Yes |
| Benzo(a)anthracene | 1.0 | ug/l | 1 | - | U | Yes |
| Benzo(a)pyrene | 1.0 | ug/l | 1 | - | U | Yes |
| Benzo(b)fluoranthene | 1.0 | ug/l | 1 | - | U | Yes |
| Benzo(g,h,i)perylene | 1.0 | ug/l | 1 | - | U | Yes |
| Benzo(k)fluoranthene | 1.0 | ug/l | 1 | - | U | Yes |
| 4-Bromophenyl phenyl ether | 2.0 | ug/l | 1 | - | U | Yes |
| Butyl benzyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| 1,1'-Biphenyl | 1.0 | ug/l | 1 | - | U | Yes |
| 2-Chloronaphthalene | 2.0 | ug/l | 1 | - | U | Yes |
| 4-Chloroaniline | 5.0 | ug/l | 1 | - | U | Yes |
| Carbazole | 1.0 | ug/l | 1 | - | U | Yes |
| Caprolactam | 2.0 | ug/l | 1 | - | U | Yes |
| Chrysene | 1.0 | ug/l | 1 | - | U | Yes |
| bis(2-Chloroethoxy)methane | 2.0 | ug/l | 1 | - | U | Yes |
| bis(2-Chloroethyl)ether | 2.0 | ug/l | 1 | - | U | Yes |
| bis(2-Chloroisopropyl)ether | 2.0 | ug/l | 1 | - | U | Yes |
| 4-Chlorophenyl phenyl ether | 2.0 | ug/l | 1 | - | U | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | 1.0 | ug/l | 1 | - | UJ | Yes |
| 2,6-Dinitrotoluene | 1.0 | ug/l | 1 | - | U | Yes |
| 3,3'-Dichlorobenzidine | 2.0 | ug/l | 1 | - | U | Yes |
| Dibenzo(a,h)anthracene | 1.0 | ug/l | 1 | - | U | Yes |
| Dibenzofuran | 5.0 | ug/l | 1 | - | U | Yes |
| Di-n-butyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| Di-n-octyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| Diethyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| Dimethyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| bis(2-Ethylhexyl)phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| Fluoranthene | 1.0 | ug/l | 1 | - | U | Yes |
| Fluorene | 1.0 | ug/l | 1 | - | U | Yes |
| Hexachlorobenzene | 1.0 | ug/l | 1 | - | U | Yes |
| Hexachlorobutadiene | 1.0 | ug/l | 1 | - | U | Yes |
| Hexachlorocyclopentadiene | 10 | ug/l | 1 | - | U | Yes |
| Hexachloroethane | 2.0 | ug/l | 1 | - | U | Yes |
| Indeno(1,2,3-cd)pyrene | 1.0 | ug/l | 1 | - | U | Yes |
| Isophorone | 2.0 | ug/l | 1 | - | U | Yes |
| 1-Methylnaphthalene | 1.0 | ug/l | 1 | - | U | Yes |
| 2-Methylnaphthalene | 1.0 | ug/l | 1 | - | U | Yes |
| 2-Nitroaniline | 5.0 | ug/l | 1 | - | UJ | Yes |
| 3-Nitroaniline | 5.0 | ug/l | 1 | - | U | Yes |
| 4-Nitroaniline | 5.0 | ug/l | 1 | - | U | Yes |
| Nitrobenzene | 2.0 | ug/l | 1 | - | U | Yes |
| N-Nitroso-di-n-propylamine | 2.0 | ug/l | 1 | - | U | Yes |
| Nitrosodiphenylamine | 5.0 | ug/l | 1 | - | U | Yes |
| Phenanthrene | 1.0 | ug/l | 1 | - | U | Yes |
| Pyrene | 1.0 | ug/l | 1 | - | U | Yes |
| 1,2,4,5-Tetrachlorobenzene | 2.0 | ug/l | 1 | - | U | Yes |

METHOD: 8270D (SIM)

| | | | | | | |
|---|---|---|---|---|---|---|
| Naphthalene | 0.10 | ug/l | 1 | - | U | Yes |
| 1,4-Dioxane | 0.690 | ug/l | 1 | - | - | Yes |

Sample ID: JC21229-4
Sample location: BMSMC Building 5 Area
Sampling date: 5/27/2016
Matrix: Groundwater

METHOD: 8270D

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| 2-Chlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| 4-Chloro-3-methyl phenol | 5.0 | ug/l | 1 | - | U | Yes |
| 2,4-Dichlorophenol | 2.0 | ug/l | 1 | - | U | Yes |
| 2,4-Dimethylphenol | 5.0 | ug/l | 1 | - | U | Yes |
| 2,4-Dinitrophenol | 10 | ug/l | 1 | - | U | Yes |
| 4,6-Dinitro-o-cresol | 5.0 | ug/l | 1 | - | U | Yes |
| 2-Methylphenol | 2.0 | ug/l | 1 | - | U | Yes |
| 3&4-Methylphenol | 2.0 | ug/l | 1 | - | U | Yes |
| 2-Nitrophenol | 5.0 | ug/l | 1 | - | U | Yes |
| 4-Nitrophenol | 10 | ug/l | 1 | - | U | Yes |
| Pentachlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| Phenol | 2.0 | ug/l | 1 | - | U | Yes |
| 2,3,4,6-Tetrachlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| 2,4,5-Trichlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| 2,4,6-Trichlorophenol | 5.0 | ug/l | 1 | - | U | Yes |
| Acenaphthene | 1.0 | ug/l | 1 | - | U | Yes |
| Acenaphthylene | 1.0 | ug/l | 1 | - | U | Yes |
| Acetophenone | 2.0 | ug/l | 1 | - | U | Yes |
| Anthracene | 1.0 | ug/l | 1 | - | U | Yes |
| Atrazine | 2.0 | ug/l | 1 | - | U | Yes |
| Benzaldehyde | 5.0 | ug/l | 1 | - | U | Yes |
| Benzo(a)anthracene | 1.0 | ug/l | 1 | - | U | Yes |
| Benzo(a)pyrene | 1.0 | ug/l | 1 | - | U | Yes |
| Benzo(b)fluoranthene | 1.0 | ug/l | 1 | - | U | Yes |
| Benzo(g,h,i)perylene | 1.0 | ug/l | 1 | - | U | Yes |
| Benzo(k)fluoranthene | 1.0 | ug/l | 1 | - | U | Yes |
| 4-Bromophenyl phenyl ether | 2.0 | ug/l | 1 | - | U | Yes |
| Butyl benzyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| 1,1'-Biphenyl | 1.0 | ug/l | 1 | - | U | Yes |
| 2-Chloronaphthalene | 2.0 | ug/l | 1 | - | U | Yes |
| 4-Chloroaniline | 5.0 | ug/l | 1 | - | U | Yes |
| Carbazole | 1.0 | ug/l | 1 | - | U | Yes |
| Caprolactam | 2.0 | ug/l | 1 | - | U | Yes |
| Chrysene | 1.0 | ug/l | 1 | - | U | Yes |
| bis(2-Chloroethoxy)methane | 2.0 | ug/l | 1 | - | U | Yes |
| bis(2-Chloroethyl)ether | 2.0 | ug/l | 1 | - | U | Yes |
| bis(2-Chloroisopropyl)ether | 2.0 | ug/l | 1 | - | U | Yes |
| 4-Chlorophenyl phenyl ether | 2.0 | ug/l | 1 | - | U | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | 1.0 | ug/l | 1 | - | UJ | Yes |
| 2,6-Dinitrotoluene | 1.0 | ug/l | 1 | - | U | Yes |
| 3,3'-Dichlorobenzidine | 2.0 | ug/l | 1 | - | U | Yes |
| Dibenzo(a,h)anthracene | 1.0 | ug/l | 1 | - | U | Yes |
| Dibenzofuran | 5.0 | ug/l | 1 | - | U | Yes |
| Di-n-butyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| Di-n-octyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| Diethyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| Dimethyl phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| bis(2-Ethylhexyl)phthalate | 2.0 | ug/l | 1 | - | U | Yes |
| Fluoranthene | 1.0 | ug/l | 1 | - | U | Yes |
| Fluorene | 1.0 | ug/l | 1 | - | U | Yes |
| Hexachlorobenzene | 1.0 | ug/l | 1 | - | U | Yes |
| Hexachlorobutadiene | 1.0 | ug/l | 1 | - | U | Yes |
| Hexachlorocyclopentadiene | 10 | ug/l | 1 | - | U | Yes |
| Hexachloroethane | 2.0 | ug/l | 1 | - | U | Yes |
| Indeno(1,2,3-cd)pyrene | 1.0 | ug/l | 1 | - | U | Yes |
| Isophorone | 2.0 | ug/l | 1 | - | U | Yes |
| 1-Methylnaphthalene | 1.0 | ug/l | 1 | - | U | Yes |
| 2-Methylnaphthalene | 1.0 | ug/l | 1 | - | U | Yes |
| 2-Nitroaniline | 5.0 | ug/l | 1 | - | UJ | Yes |
| 3-Nitroaniline | 5.0 | ug/l | 1 | - | U | Yes |
| 4-Nitroaniline | 5.0 | ug/l | 1 | - | U | Yes |
| Nitrobenzene | 2.0 | ug/l | 1 | - | U | Yes |
| N-Nitroso-di-n-propylamine | 2.0 | ug/l | 1 | - | U | Yes |
| Nitrosodiphenylamine | 5.0 | ug/l | 1 | - | U | Yes |
| Phenanthrene | 1.0 | ug/l | 1 | - | U | Yes |
| Pyrene | 1.0 | ug/l | 1 | - | U | Yes |
| 1,2,4,5-Tetrachlorobenzene | 2.0 | ug/l | 1 | - | U | Yes |
| METHOD: 8270D (SIM) | | | | | | |
| Naphthalene | 0.10 | ug/l | 1 | - | U | Yes |
| 1,4-Dioxane | 0.10 | ug/l | 1 | - | U | Yes |

DATA REVIEW WORKSHEETS

Project Number:_JC21229_____
Date:_____May_27,_2016_____
Shipping Date:__May_27,_2016_____
EPA Region:_____2_____

## REVIEW OF SEMIVOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: EPA Hazardous Waste Support Section, SOP HW-35A, July 2015 –Revision 0. *Semivolatile Data Validation*. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for SVOCs included:

Lab. Project/SDG No.: ____JC21229_____ Sample matrix: _Soil/Groundwater__
No. of Samples: ___4_Full_scan/4_SIM_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:_____JC2129-4_____
Field duplicate No.:_____-_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_ABN_TCL_list_by_method_SW846-8270D;_Naphthalene_and_1,4-Dioxane_
_analyzed_by_method_SW846-8270D_(SIM)_____
_____

Definition of Qualifiers:

J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:___June_22,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

| MISSING INFORMATION | DATE LAB. CONTACTED | DATE RECEIVED |
|---|---|---|

All criteria were met __X__
Criteria were not met
and/or see below _____

## HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

| SAMPLE ID | DATE SAMPLED | DATE EXTRACTED/ANALYZED | pH | ACTION |
|---|---|---|---|---|
| | | | | |
| All samples extracted and analyzed within method recommended holding time. Sample preservation was acceptable. | | | | |
| | | | | |
| | | | | |

Cooler temperature (Criteria: 4 ± 2 °C): _____5.6°C_____

Actions

Results will be qualified based on the criteria of the following Table:

**Table 1. Holding Time Actions for Semivolatile Analyses**

| Matrix | Preserved | Criteria | Action | |
|---|---|---|---|---|
| | | | Detected Associated Compounds | Non-Detected Associated Compounds |
| Aqueous | No | ≤ 7 days (for extraction) ≤ 40 days (for analysis) | Use professional judgment | |
| | No | > 7 days (for extraction) > 40 days (for analysis) | J | Use professional judgment |
| | Yes | ≤ 7 days (for extraction) ≤ 40 days (for analysis) | No qualification | |
| | Yes | > 7 days (for extraction) > 40 days (for analysis) | J | UJ |
| | Yes/No | Grossly Exceeded | J | UJ or R |
| Non-Aqueous | No | ≤ 14 days (for extraction) ≤ 40 days (for analysis) | Use professional judgment | |
| | No | > 14 days (for extraction) > 40 days (for analysis) | J | Use professional judgment |
| | Yes | ≤ 14 days (for extraction) ≤ 40 days (for analysis) | No qualification | |
| | Yes | > 14 days (for extraction) > 40 days (for analysis) | J | UJ |
| | Yes/No | Grossly Exceeded | J | UJ or R |

All criteria were met _X__
Criteria were not met see below ____

## GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

_X__ The DFTPP performance results were reviewed and found to be within the specified criteria.

_X__ DFTPP tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

Notes: These requirements do not apply when samples are analyzed by the Selected Ion Monitoring (SIM) technique.

All mass spectrometer conditions must be identical to those used during the sample analysis. Background subtraction actions resulting in spectral distortion are unacceptable

Notes: No data should be qualified based of DFTPP failure.

The requirement to analyze the instrument performance check solution is optional when analysis of PAHs/pentachlorophenol is to be performed by the SIM technique.

List the samples affected:

_____

_____

_____

_____

Actions:

1. If sample are analyzed without a preceding valid instrument performance check or are analyzed 12 hours after the Instrument Performance Check, qualify all data in those samples as unusable (R).
2. If ion abundance criteria are not met, use professional judgment to determine to what extent the data may be utilized.
3. State in the Data Review Narrative, decisions to use analytical data associated with DFTPP instrument performance checks not meeting the contract requirements.
4. Use professional judgment to determine if associated data should be qualified based on the spectrum of the mass calibration compounds.

All criteria were met ___X___
Criteria were not met
and/or see below _____

## INITIAL CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:__05/13/16_(Scan)____ _____05/17/16_(SIM)_____
Instrument ID numbers:_____GCMS6P_____ _____GCMS3M_____
Matrix/Level:_____Aqueous/low_____ _____Aqueous/low_____

Date of initial calibration:__06/06/2016_(SIM)____
Instrument ID numbers:_____GCMS4P_____
Matrix/Level:_____Aqueous/low_____

| DATE | LAB FILE ID# | CRITERIA OUT RFs, %RSD, %D, r | COMPOUND | SAMPLES AFFECTED |
|---|---|---|---|---|
| | | | | |
| Initial and initial calibration verification meets the method and guidance validation document performance criteria. | | | | |
| | | | | |

Actions:

Qualify the initial calibration analytes listed in Table 2 using the following criteria:

**Table 3. Initial Calibration Actions for Semivolatile Analysis**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| Initial Calibration not performed at specified frequency and sequence | Use professional judgment R | Use professional judgment R |
| Initial Calibration not performed at the specified concentrations | J | UJ |
| RRF < Minimum RRF in Table 2 for target analyte | Use professional judgment J or R | R |
| RRF > Minimum RRF in Table 2 for target analyte | No qualification | No qualification |
| %RSD > Maximum %RSD in Table 2 for target analyte | J | Use professional judgment |
| %RSD ≤ Maximum %RSD in Table 2 for target analyte | No qualification | No qualification |

## Initial Calibration

**Table 2. RRF, %RSD, and %D Acceptance Criteria in Initial Calibration and CCV for Semivolatile Analysis**

| Analyte | Minimum RRF | Maximum %RSD | Opening Maximum %D[1] | Opening Maximum %D[1] |
|---|---|---|---|---|
| 1,4-Dioxane | 0.010 | 40.0 | ≤40.0 | ≤50.0 |
| Benzaldehyde | 0.100 | 40.0 | ≤40.0 | ≤50.0 |
| Phenol | 0.080 | 20.0 | ≤20.0 | ≤25.0 |
| Bis(2-chloroethyl)ether | 0.100 | 20.0 | ≤20.0 | ≤25.0 |
| 2-Chlorophenol | 0.200 | 20.0 | ≤20.0 | ≤25.0 |
| 2-Methylphenol | 0.010 | 20.0 | ≤20.0 | ≤25.0 |
| 3-Methylphenol | 0.010 | 20.0 | ≤20.0 | ≤25.0 |
| 2,2'-Oxybis-(1-chloropropane) | 0.010 | 20.0 | ≤25.0 | ≤50.0 |
| Acetophenone | 0.060 | 20.0 | ≤20.0 | ≤25.0 |
| 4-Methylphenol | 0.010 | 20.0 | ≤20.0 | ≤25.0 |
| N-Nitroso-di-n-propylamine | 0.080 | 20.0 | ≤25.0 | ≤25.0 |
| Hexachloroethane | 0.100 | 20.0 | ≤20.0 | ≤25.0 |
| Nitrobenzene | 0.090 | 20.0 | ≤20.0 | ≤25.0 |
| Isophorone | 0.100 | 20.0 | ≤20.0 | ≤25.0 |
| 2-Nitrophenol | 0.060 | 20.0 | ≤20.0 | ≤25.0 |
| 2,4-Dimethylphenol | 0.050 | 20.0 | ≤25.0 | ≤50.0 |
| Bis(2-chloroethoxy)methane | 0.080 | 20.0 | ≤20.0 | ≤25.0 |
| 2,4-Dichlorophenol | 0.060 | 20.0 | ≤20.0 | ≤25.0 |
| Naphthalene | 0.200 | 20.0 | ≤20.0 | ≤25.0 |
| 4-Chloroaniline | 0.010 | 40.0 | ≤40.0 | ≤50.0 |
| Hexachlorobutadiene | 0.040 | 20.0 | ≤20.0 | ≤25.0 |
| Caprolactam | 0.010 | 40.0 | ≤30.0 | ≤50.0 |
| 4-Chloro-3-methylphenol | 0.040 | 20.0 | ≤20.0 | ≤25.0 |
| 2-Methylnaphthalene | 0.100 | 20.0 | ≤20.0 | ≤25.0 |
| Hexachlorocyclopentadiene | 0.010 | 40.0 | ≤40.0 | ≤50.0 |
| 2,4,6-Trichlorophenol | 0.090 | 20.0 | ≤20.0 | ≤25.0 |
| 2,4,5-Trichlorophenol | 0.100 | 20.0 | ≤20.0 | ≤25.0 |
| 1,1'-Biphenyl | 0.200 | 20.0 | ≤20.0 | ≤25.0 |

| Analyte | Minimum RRF | Maximum %RSD | Opening Maximum %D[1] | Opening Maximum %D[1] |
|---|---|---|---|---|
| 2-Chloronaphthalene | 0.300 | 20.0 | -20.0 | -25.0 |
| 2-Nitroaniline | 0.060 | 20.0 | -25.0 | -25.0 |
| Dimethylphthalate | 0.300 | 20.0 | -25.0 | -25.0 |
| 2,6-Dinitrotoluene | 0.080 | 20.0 | -20.0 | -25.0 |
| Acenaphthylene | 0.400 | 20.0 | -20.0 | -25.0 |
| 3-Nitroaniline | 0.010 | 20.0 | -25.0 | -50.0 |
| Acenaphthene | 0.200 | 20.0 | -20.0 | -25.0 |
| 2,4-Dinitrophenol | 0.010 | 40.0 | -50.0 | -50.0 |
| 4-Nitrophenol | 0.010 | 40.0 | -40.0 | -50.0 |
| Dibenzofuran | 0.300 | 20.0 | -20.0 | -25.0 |
| 2,4-Dinitrotoluene | 0.070 | 20.0 | -20.0 | -25.0 |
| Diethylphthalate | 0.300 | 20.0 | -20.0 | -25.0 |
| 1,2,4,5-Tetrachlorobenzene | 0.100 | 20.0 | -20.0 | -25.0 |
| 4-Chlorophenyl-phenylether | 0.100 | 20.0 | -20.0 | -25.0 |
| Fluorene | 0.200 | 20.0 | -20.0 | -25.0 |
| 4-Nitroaniline | 0.010 | 40.0 | -40.0 | -50.0 |
| 4,6-Dinitro-2-methylphenol | 0.010 | 40.0 | -30.0 | -50.0 |
| 4-Bromophenyl-phenyl ether | 0.070 | 20.0 | -20.0 | -25.0 |
| N-Nitrosodiphenylamine | 0.100 | 20.0 | -20.0 | -25.0 |
| Hexachlorobenzene | 0.050 | 20.0 | -20.0 | -25.0 |
| Atrazine | 0.010 | 40.0 | -25.0 | -50.0 |
| Pentachlorophenol | 0.010 | 40.0 | -40.0 | -50.0 |
| Phenanthrene | 0.200 | 20.0 | -20.0 | -25.0 |
| Anthracene | 0.200 | 20.0 | -20.0 | -25.0 |
| Carbazole | 0.050 | 20.0 | -20.0 | -25.0 |
| Di-n-butylphthalate | 0.500 | 20.0 | -20.0 | -25.0 |
| Fluoranthene | 0.100 | 20.0 | -20.0 | -25.0 |
| Pyrene | 0.400 | 20.0 | -25.0 | -50.0 |
| Butylbenzylphthalate | 0.100 | 20.0 | -25.0 | -50.0 |

| Analyte | Minimum RRF | Maximum %RSD | Opening Maximum %D[1] | Opening Maximum %D[1] |
|---|---|---|---|---|
| 3,3'-Dichlorobenzidine | 0.010 | 40.0 | - 40.0 | - 50.0 |
| Benzo(a)anthracene | 0.300 | 20.0 | - 20.0 | - 25.0 |
| Chrysene | 0.200 | 20.0 | - 20.0 | - 50.0 |
| Bis(2-ethylhexyl) phthalate | 0.200 | 20.0 | - 25.0 | - 50.0 |
| Di-n-octylphthalate | 0.010 | 40.0 | - 40.0 | - 50.0 |
| Benzo(b)fluoranthene | 0.010 | 20.0 | - 25.0 | - 50.0 |
| Benzo(k)fluoranthene | 0.010 | 20.0 | - 25.0 | - 50.0 |
| Benzo(a)pyrene | 0.010 | 20.0 | - 20.0 | - 50.0 |
| Indeno(1,2,3-cd)pyrene | 0.010 | 20.0 | - 25.0 | - 50.0 |
| Dibenzo(a,h)anthracene | 0.010 | 20.0 | - 25.0 | - 50.0 |
| Benzo(g,h,i)perylene | 0.010 | 20.0 | - 30.0 | - 50.0 |
| 2,3,4,6-Tetrachlorophenol | 0.040 | 20.0 | - 20.0 | - 50.0 |
| Naphthalene | 0.600 | 20.0 | - 25.0 | - 25.0 |
| 2-Methylnaphthalene | 0.300 | 20.0 | - 20.0 | - 25.0 |
| Acenaphthylene | 0.900 | 20.0 | - 20.0 | - 25.0 |
| Acenaphthene | 0.500 | 20.0 | - 20.0 | - 25.0 |
| Fluorene | 0.700 | 20.0 | - 25.0 | - 50.0 |
| Phenanthrene | 0.300 | 20.0 | - 25.0 | - 50.0 |
| Anthracene | 0.400 | 20.0 | - 25.0 | - 50.0 |
| Fluoranthene | 0.400 | 20.0 | - 25.0 | - 50.0 |
| Pyrene | 0.500 | 20.0 | - 30.0 | - 50.0 |
| Benzo(a)anthracene | 0.400 | 20.0 | - 25.0 | - 50.0 |
| Chrysene | 0.400 | 20.0 | - 25.0 | - 50.0 |
| Benzo(b)fluoranthene | 0.100 | 20.0 | - 30.0 | - 50.0 |
| Benzo(k)fluoranthene | 0.100 | 20.0 | - 30.0 | - 50.0 |
| Benzo(a)pyrene | 0.100 | 20.0 | - 25.0 | - 50.0 |
| Indeno(1,2,3-cd)pyrene | 0.100 | 20.0 | - 40.0 | - 50.0 |
| Dibenzo(a,h)anthracene | 0.010 | 25.0 | - 40.0 | - 50.0 |
| Benzo(g,h,i)perylene | 0.020 | 25.0 | - 40.0 | - 50.0 |

| | | | | |
|---|---|---|---|---|
| Pentachlorophenol | 0.010 | 40.0 | ≤ 50.0 | ≤ 50.0 |
| **Deuterated Monitoring Compounds** | | | | |

| Analyte | Minimum RRF | Maximum %RSD | Opening Maximum %D[1] | Closing Maximum %D |
|---|---|---|---|---|
| 1,4-Dioxane-$d_8$ | 0.010 | 20.0 | ≤ 25.0 | ≤ 50.0 |
| Phenol-$d_5$ | 0.010 | 20.0 | ≤ 25.0 | ≤ 25.0 |
| Bis-(2-chloroethyl)ether-$d_8$ | 0.100 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| 2-Chlorophenol-$d_4$ | 0.200 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| 4-Methylphenol-$d_8$ | 0.010 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| 4-Chloroaniline-$d_4$ | 0.010 | 40.0 | ≤ 40.0 | ≤ 50.0 |
| Nitrobenzene-$d_5$ | 0.050 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| 2-Nitrophenol-$d_4$ | 0.050 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| 2,4-Dichlorophenol-$d_3$ | 0.060 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| Dimethylphthalate-$d_6$ | 0.300 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| Acenaphthylene-$d_8$ | 0.400 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| 4-Nitrophenol-$d_4$ | 0.010 | 40.0 | ≤ 40.0 | ≤ 50.0 |
| Fluorene-$d_{10}$ | 0.100 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| 4,6-Dinitro-2-methylphenol-$d_2$ | 0.010 | 40.0 | ≤ 30.0 | ≤ 50.0 |
| Anthracene-$d_{10}$ | 0.300 | 20.0 | ≤ 20.0 | ≤ 25.0 |
| Pyrene-$d_{10}$ | 0.300 | 20.0 | ≤ 25.0 | ≤ 50.0 |
| Benzo(a)pyrene-$d_{12}$ | 0.010 | 20.0 | ≤ 20.0 | ≤ 50.0 |
| Fluoranthene-$d_{10}$ (SIM) | 0.400 | 20.0 | ≤ 25.0 | ≤ 50.0 |
| 2-Methylnaphthalene-$d_{10}$ (SIM) | 0.300 | 20.0 | ≤ 20.0 | ≤ 25.0 |

[1] If a closing CCV is acting as an opening CCV, all target analytes must meet the requirements for an opening CCV.

Note: If analysis by SIM technique is requested for PAH/pentachlorophenols, calibration standards analyzed at 0.10, 0.20, 0.40, 0.80, and 1.0 ng/uL for each target compound of interest and the associated DMCs. Pentachlorophenol will require only a four point initial calibration at 0.20, 0.40, 0.80, and 1.0 ng/uL.

All criteria were met _____
Criteria were not met
and/or see below __X__

CONTINUING CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:___05/13/16_(Scan)_____
Date of initial calibration verification (ICV):_05/13/16;_05/16/16_____
Date of continuing calibration verification (CCV):_05/31/16;_06/02/16;_06/06/16_____
Date of closing CCV:_____-_____ _____-_____
Instrument ID numbers:_____GCMS6P_____
Matrix/Level:_____Aqueous/low_____ _____

Date of initial calibration:____06/06/16_(Scan)_____ _____05/17/16_(SIM)_____
Date of initial calibration verification (ICV):____016/06/16___ _____05/17-18/16_____
Date of continuing calibration verification (CCV):__06/13/16_ _06/01/16;_06/07/16;_06/10/16_____
Date of closing CCV:_____ _____06/08/16_____
Instrument ID numbers:_____GCMS4P_____ _____GCMS3M_____
Matrix/Level:_____Aqueous/low_____ _____Aqueous/low_____

| DATE | LAB FILE ID# | CRITERIA OUT RFs, %RSD, %D, r | COMPOUND | SAMPLES AFFECTED |
|---|---|---|---|---|
| GCMS6P | | | | |
| 05/31/16 | cc1209-50 | -30.0 | 2-nitroaniline | JC21229-3; -4 |
| | | -21.0 | 2,4-dinitrotoluene | |
| | | -31.4 | di-n-octylphthalate* | |
| | | | | |
| 06/06/16 | cc1209-25 | 23.7 | 1,4-dioxane* | JC21229-1; -2 |
| | | 40.7 | Hexachlorocyclopentadiene | |
| | | -21.9 | 2-nitroaniline | |
| | | | di-n-octylphthalate* | |

**Note:** Initial and continuing calibration verifications meet the method and guidance document required performance criteria except the cases describe in this document.
No closing calibration verification included in data package. No action taken, professional judgment.

* Analytes with % difference in the continue calibration verification outside the method performance criteria but within the validation guidelines criteria, +40 %. No action taken.

GCMS instrument GCMS6P used in the scan mode for QC samples on 06/02/16. Several analytes missed the % difference criteria. No action taken, QC samples are not validated.

Actions:

Notes: Verify that the CCV is run at the required frequency (an opening and closing CCV must be run within 12-hour period).

All DMCs must meet the RRF values given in Table 2. No qualification of the data is necessary on DMCs RRF and %RSD/%D alone. Use professional judgment to evaluate DMCs and %RSD/%D data in conjunction with DMCs recoveries to determine the need for qualification of the data.

Qualify the initial calibration analytes listed in Table 2 using the following criteria in the CCVs:

**Table 4. CCV Actions for Semivolatile Analysis**

| Criteria for Opening CCV | Criteria for Closing CCV | Action | |
|---|---|---|---|
| | | Detect | Non-detect |
| CCV not performed at required frequency and sequence | CCV not performed at required frequency | Use professional judgment R | Use professional judgment R |
| CCV not performed at specified concentration | CCV not performed at specified concentration | Use professional judgment | Use professional judgment |
| RRF < Minimum RRF in Table 2 for target analyte | RRF < Minimum RRF in Table 2 for target analyte | Use professional judgment J or R | R |
| RRF > Minimum RRF in Table 2 for target analyte | RRF > Minimum RRF in Table 2 for target analyte | No qualification | No qualification |
| %D outside the Opening Maximum %D limits in Table 2 for target analyte | %D outside the Closing Maximum %D limits in Table 2 for target analyte | J | UJ |
| %D within the inclusive Opening Maximum %D limits in Table 2 for target analyte | %D within the inclusive Closing Maximum %D limits in Table 2 for target analyte | No qualification | No qualification |

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Notes: The concentration of non-target compounds in all blanks must be less than or equal to 10 ug/L.

The concentration of target compounds in all blanks must be less than its CRQL listed in the method.

Samples taken from a drinking water tap do not have and associated field blank.

Laboratory blanks

| DATE ANALYZED | LAB ID | LEVEL/ MATRIX | COMPOUND | CONCENTRATION UNITS |
|---|---|---|---|---|
| No target analytes detected in method blanks. | | | | |

Field/Equipment/Trip blank

| DATE ANALYZED | LAB ID | LEVEL/ MATRIX | COMPOUND | CONCENTRATION UNITS |
|---|---|---|---|---|
| No target analytes detected in the equipment blank. No field/trip blanks analyzed with this data package. | | | | |

All criteria were met __X__
Criteria were not met
and/or see below _____

## BLANK ANALYSIS RESULTS (Section 3)

### Blank Actions

### Qualify samples based on the criteria summarized in Table 5:

**Table 5. Blank and TCLP/SPLP LEB Actions for Semivolatile Analysis**

| Blank Type | Blank Result | Sample Result | Action |
|---|---|---|---|
| Method, TCLP/SPLP LEB, Field | Detect | Non-detect | No qualification |
| | < CRQL | < CRQL | Report at CRQL and qualify as non-detect (U) |
| | | > CRQL | Use professional judgment |
| | > CRQL | < CRQL | Report at CRQL and qualify as non-detect (U) |
| | | > CRQL but < Blank Result | Report at sample results and qualify as non-detect (U) or as unusable (R) |
| | | > CRQL and > Blank Result | Use professional judgment |
| | Grossly high | Detect | Report at sample results and qualify as unusable (R) |
| | TIC > 5.0 ug/L (water) or 0.0050 mg/L (TCLP leachate) or TIC > 170 ug/Kg (soil) | Detect | Use professional judgment |

### List samples qualified

| CONTAMINATION SOURCE/LEVEL | COMPOUND | CONC/UNITS | AL/UNITS | SQL | AFFECTED SAMPLES |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

All criteria were met __X__
Criteria were not met
and/or see below ____

## SURROGATE SPIKE RECOVERIES – DEUTERATED MONITORING COMPOUNDS (DMCs)

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries – deuterated monitoring compounds. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

Notes: Recoveries for DMCs in samples and blanks must be within the limits specified in Table 6.

The recovery limits for any of the compounds listed in Table 6 may be expanded at any time during the period of performance if USEPA determines that the limits are too restrictive.

If a DMC is not added in the samples and blanks or the concentrations of DMCs in the samples and blank not the specified, use professional judgment in qualifying the data.

**Table 7. DMC Actions for Semivolatile Analysis**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| %R < 10% (excluding DMCs with 10% as a lower acceptance limit) | J- | R |
| 10% ≤ %R (excluding DMCs with 10% as a lower acceptance limit) < Lower Acceptance Limit | J- | UJ |
| Lower Acceptance limit ≤ %R ≤ Upper Acceptance Limit | No qualification | No qualification |
| %R > Upper Acceptance Limit | J+ | No qualification |

List the percent recoveries (%Rs) which do not meet the criteria for DMCs (surrogate) recovery.

Matrix:___Groundwater/Soil_____

**SAMPLE ID** **SURROGATE COMPOUND** **ACTION**

_____

_DMCs_meet_the_required_criteria._Non-deuterated_surrogates_added_to_the_samples_were_____
_within_laboratory_recovery_limits._____

**Table 8. Semivolatile DMCs and the Associated Target Analytes**

| **1,4–Dioxane-$d_8$ (DMC-1)** | **Phenol-$d_5$ (DMC-2)** | **Bis(2-Chloroethyl) ether-$d_8$ (DMC-3)** |
|---|---|---|
| 1,4-Dioxane | Benzaldehyde<br>Phenol | Bis(2-chloroethyl)ether<br>2,2'-Oxybis(1-chloropropane)<br>Bis(2-chloroethoxy)methane |
| **2-Chlorophenol-$d_4$ (DMC-4)** | **4-Methylphenol-$d_8$ (DMC-5)** | **4-Chloroaniline-$d_4$ (DMC-6)** |
| 2-Chlorophenol | 2-Methylphenol<br>3-Methylphenol<br>4-Methylphenol<br>2,4-Dimethylphenol | 4-Chloroaniline<br>Hexachlorocyclopentadiene<br>Dichlorobenzidine |
| **Nitrobenzene-$d_5$ (DMC-7)** | **2-Nitrophenol-$d_4$ (DMC-8)** | **2,4-Dichlorophenol-$d_3$ (DMC-9)** |
| Acetophenone<br>N-Nitroso-di-n-propylamine<br>Hexachloroethane<br>Nitrobenzene<br>2,6-Dinitrotoluene<br>2,4-Dinitrotoluene<br>N-Nitrosodiphenylamine | Isophorone<br>2-Nitrophenol | 2,4-Dichlorophenol<br>Hexachlorobutadiene<br>Hexachlorocyclopentadiene<br>4-Chloro-3-methylphenol<br>2,4,6-Trichlorophenol<br>2,4,5-Trichlorophenol<br>1,2,4,5-Tetrachlorobenzene<br>*Pentachlorophenol<br>2,3,4,6-Tetrachlorophenol |
| **Dimethylphthalate-$d_6$ (DMC-10)** | **Acenaphthylene-$d_8$ (DMC-11)** | **4-Nitrophenol-$d_4$ (DMC-12)** |
| Caprolactam<br>1,1'-Biphenyl<br>Dimethylphthalate<br>Diethylphthalate<br>Di-n-butylphthalate<br>Butylbenzylphthalate<br>Bis(2-ethylhexyl) phthalate<br>Di-n-octylphthalate | *Naphthalene<br>*2-Methylnaphthalene<br>2-Chloronaphthalene<br>*Acenaphthylene<br>*Acenaphthene | 2-Nitroaniline<br>3-Nitroaniline<br>2,4-Dinitrophenol<br>4-Nitrophenol<br>4-Nitroaniline |

| **Fluorene-$d_{10}$ (DMC-13)** | **4,6-Dinitro-2-methylphenol-$d_2$ (DMC-14)** | **Anthracene-$d_{10}$ (DMC-15)** |
|---|---|---|
| Dibenzofuran<br>*Fluorene<br>4-Chlorophenyl-phenylether<br>4-Bromophenyl-phenylether<br>Carbazole | 4,6-Dinitro-2-methylphenol | Hexachlorobenzene<br>Atrazine<br>*Phenanthrene<br>*Anthracene |
| **Pyrene-$d_{10}$ (DMC-16)** | **Benzo(a)pyrene-$d_{12}$ (DMC-17)** | |
| *Fluoranthene<br>*Pyrene<br>*Benzo(a)anthracene<br>*Chrysene | 3,3'-Dichlorobenzidine<br>*Benzo(b)fluoranthene<br>*Benzo(k)fluoranthene<br>*Benzo(a)pyrene<br>*Indeno(1,2,3-cd)pyrene<br>*Dibenzo(a,h)anthracene<br>*Benzo(g,h,i)perylene | |

*Included in optional Target Analyte List (TAL) of PAHs and PCP only.

**Table 9. Semivolatile SIM DMCs and the Associated Target Analytes**

| **Fluoranthene-d10 (DMC-1)** | **2-Methylnaphthalene-d10 (DMC-2)** |
|---|---|
| Fluoranthene | Naphthalene |
| Pyrene | 2-Methylnaphthalene |
| Benzo(a)anthracene | Acenaphthylene |
| Chrysene | Acenaphthene |
| Benzo(b)fluoranthene | Fluorene |
| Benzo(k)fluoranthene | Pentachlorophenol |
| Benzo(a)pyrene | Phenanthrene |
| Indeno(1,2,3-cd)pyrene | Anthracene |
| Dibenzo(a,h)anthracene | |
| Benzo(g,h,i)perylene | |

All criteria were met _____
Criteria were not met
and/or see below ___X___

## VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

**NOTES:** Data for MS and MSDs will not be present unless requested by the Region. Notify the Contract Laboratory COR if a field or trip blank was used for the MS and MSD.

For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC20992-1_____ Matrix/Level:__Aqueous_____
Sample ID:__JC21230-2_____ Matrix/Level:__Soil_____
Sample ID:__JC20992-2_(SIM)_____ Matrix/Level:__Aqueous_____
Sample ID:__JC21229-2_(SIM)_____ Matrix/Level:__Soil_____

The QC reported here applies to the following samples: Method: SW846 8270D
JC21229-3, JC21229-4

| Compound | JC20992-1 ug/l | Q | Spike ug/l | MS ug/l | MS % | Spike ug/l | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 3,3'-Dichlorobenzidine | ND | | 200 | 83.5 | 42 | 200 | 51.0 | 26 | 48* a | 10-107/47 |

(a) Outside of in house control limits.
* - outside control limits

**Note:** MS/MSD % recoveries results and RPD apply to unspiked sample. Unspiked sample was from another project. No qualifications made.

The QC reported here applies to the following samples: Method: SW846 8270D
JC21229-1, JC21229-2

| Compound | JC21230-2 ug/l | Q | Spike ug/kg | MS ug/kg | MS % | Spike ug/kg | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 3-Nitroaniline | ND | | 2060 | 1030 | 50 | 1950 | 691 | 35 | 39* a | 12-112/38 |

(a) Outside of in house control limits.
* - outside control limits

**Note:** MS/MSD % recoveries results and RPD apply to unspiked sample. Unspiked sample was from another project. No qualifications made.

The QC reported here applies to the following samples: Method: SW846 8270D BY SIM
JC21229-3, JC21229-4

| Compound | JC20992-2 ug/l | Q | Spike ug/l | MS ug/l | MS % | Spike ug/l | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | ND | | 2 | 2.19 | 110 | 2 | 0.432 | 22* a | 134* b | 23-140/36 |
| 1,4-Dioxane | ND | | 2 | 0.730 | 37 | 2 | 0.230 | 12* a | 104* b | 20-160/30 |

(a) Outside in house control limits due to matrix interference.
(b) Analytical precision exceeds in-house control limits.
* Outside control limit.

**Note:** MS/MSD % recoveries results and RPD apply to unspiked sample. Unspiked sample was from another project. No qualifications made.

The QC reported here applies to the following samples: Method: SW846 8270D BY SIM
JC21229-1, JC21229-2

| Compound | JC21229-1 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | Spike ug/kg | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | ND | | 42.1 | 8.55 | 20* a | 42.1 | 10.1 | 24* a | 17 | 50-150/30 |

(a) Analytical precision exceeds in-house control limits.
* Outside control limit.

**Note:** MS/MSD % recoveries under the lower laboratory control limits. 1,4-dioxane not detected in sample JC21229-1. Non-detects are qualified as (R) in affected samples.

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

| QUALITY | %R < LL | %R > UL |
|---|---|---|
| Positive results | J | J |
| Nondetects results | R | Accept |

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below ____

INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

| DATE | SAMPLE ID | IS OUT | IS AREA | ACCEPTABLE RANGE | ACTION |
|---|---|---|---|---|---|

Internal area meets the required criteria of batch samples corresponding to this data package.

**Action:**

1. If an internal standard area count for a sample or blank is greater than 200.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration) (see Table 10 below):
   a. Qualify detects for compounds quantitated using that internal standard as estimated low (J-).
   b. Do not qualify non-detected associated compounds.
2. If an internal standard area count for a sample or blank is less than 20.0% of the area for the associated standard (opening CCV or mid-point standard from initial calibration):
   a. Qualify detects for compounds quantitated using that internal standard as estimated high (J+).
   b. Qualify non-detected associated compounds as unusable (R).
3. If an internal standard area count for a sample or blank is greater than or equal to 50.0%, and less than or equal to 200% of the area for the associated standard opening CCV or mid-point standard from initial calibration, no qualification of the data is necessary.
4. If an internal standard RT varies by more than 10.0 seconds: Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable (R) if the mass spectral criteria are met.
5. If an internal standard RT varies by less than or equal to 10.0 seconds, no qualification of the data is necessary.

**Note:** Inform the Contract Laboratory Program Project Officer (CLP PO) if the internal standard performance criteria are grossly exceeded. Note in the Data Review Narrative potential effects on the data resulting from unacceptable internal standard performance.

State in the Data Review Narrative if the required internal standard compounds are not added to a sample or blank or if the required internal standard compound is not analyzed at the specified concentration.

Actions:

**Table 10. Internal Standard Actions for Semivolatile Analysis**

| Criteria | Action | |
|---|---|---|
| | Detect | Non-detect |
| Area response < 20% of the opening CCV or mid-point standard CS3 from ICAL | J | R |
| 20% < Area response < 50% of the opening CCV or mid-point standard CS3 from ICAL | J | UJ |
| 50% < Area response < 200% of the opening CCV or mid-point standard CS3 from ICAL | No qualification | No qualification |
| Area response > 200% of the opening CCV or mid-point standard CS3 from ICAL | J- | No qualification |
| RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL > 10.0 seconds | R | R |
| RT shift between sample/blank and opening CCV or mid-point standard CS3 from ICAL < 10.0 seconds | No qualification | No qualification |

All criteria were met __X__
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

**Criteria:**

Is the Relative Retention Times (RRTs) of reported compounds within ±0.06 RRT units of the standard RRT [opening Continuing Calibration Verification (CCV) or mid-point standard from the initial calibration]. **Yes?** or No?

List compounds not meeting the criteria described above:

| Sample ID | Compounds | Actions |
|---|---|---|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

Mass spectra of the sample compound and a current laboratory-generated standard [i.e., the mass spectrum from the associated calibration standard (opening CCV or mid-point standard from initial calibration)] must match according to the following criteria:

a. All ions present in the standard mass spectrum at a relative intensity greater than 10% must be present in the sample spectrum.

b. The relative intensities of these ions must agree within ±20% between the standard and sample spectra (e.g., for an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance must be between 30-70%).

c. Ions present at greater than 10% in the sample mass spectrum, but not present in the standard spectrum, must be evaluated by a reviewer experienced in mass spectral interpretation.

List compounds not meeting the criteria described above:

| Sample ID | Compounds | Actions |
|---|---|---|
| _____ | _____ | _____ |
| _Identified_compounds_meet_the_required_criteria____ | | _____ |
| _____ | _____ | _____ |

Action:

1. The application of qualitative criteria for GC/MS analysis of target compounds requires professional judgment. It is up to the reviewer's discretion to obtain additional information from the laboratory. If it is determined that incorrect identifications were made, qualify all such data as unusable (R).

2. Use professional judgment to qualify the data if it is determined that cross-contamination has occurred.

3. Note in the Data Review Narrative any changes made to the reported compounds or concerns regarding target compound identifications. Note, for Contract Laboratory COR action, the necessity for numerous or significant changes.

TENTATIVELY IDENTIFIED COMPOUNDS (TICS)

NOTE: Tentatively identified compounds should only be evaluated when requested by a party from outside of the Hazardous Waste Support Section (HWSS).

List TICs

| Sample ID | Compound | Sample ID | Compound |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

Action:

1. Qualify all TIC results for which there is presumptive evidence of a match (e.g. greater than or equal to 85% match) as tentatively identified (NJ), with approximated concentrations. TICs labeled "unknown" are qualified as estimated (J).
2. General actions related to the review of TIC results are as follows:
   a. If it is determined that a tentative identification of a non-target compound is unacceptable, change the tentative identification to "unknown" or another appropriate identification, and qualify the result as estimated (J).
   b. If all contractually-required peaks were not library searched and quantitated, the Region's designated representative may request these data from the laboratory.
3. In deciding whether a library search result for a TIC represents a reasonable identification, use professional judgment. If there is more than one possible match, report the result as "either compound X or compound Y". If there is a lack of isomer specificity, change the TIC result to a nonspecific isomer result (e.g., 1,3,5-trimethyl benzene to trimethyl benzene isomer) or to a compound class (e.g., 2-methyl, 3-ethyl benzene to a substituted aromatic compound).
4. The reviewer may elect to report all similar compounds as a total (e.g., all alkanes may be summarized and reported as total hydrocarbons).

5. Target compounds from other fractions and suspected laboratory contaminants should be marked as "non-reportable".
6. Other Case factors may influence TIC judgments. If a sample TIC match is poor, but other samples have a TIC with a valid library match, similar RRT, and the same ions, infer identification information from the other sample TIC results.
7. Note in the Data Review Narrative any changes made to the reported data or any concerns regarding TIC identifications.
8. Note, for Contract Laboratory COR action, failure to properly evaluate and report TICs

All criteria were met __X__
Criteria were not met
and/or see below _____

## SAMPLE QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

**Action:**

1. When a sample is analyzed at more than one dilution, the lower CRQL are used unless a QC exceedance dictates the use of higher CRQLs from the diluted sample. Samples reported with an "E" qualifier should be reported from the diluted sample.
2. If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.
3. For non-aqueous samples, if the solids is less than 10.0%, use professional judgment for both detects and non-detects. If the percent solid for a soil sample is greater than or equal to 10.0% and less than 30.0%, use professional judgment to qualify detects and non-detects. If the percent solid for a soil sample is greater than or equal to 30.0%, detects and non-detects should not be qualified (see Table 11).
4. Note, for Contract Laboratory COR action, numerous or significant failures to accurately quantify the target compounds or to properly evaluate and adjust CRQLs.
5. Results between MDL and CRQL should be qualified as estimated "J".
6. Results < MDL should be reported at the CRQL and qualified "U". MDLs themselves should not be reported.

**Table 11. Percent Solids Actions for Semivolatile Analysis for Non-Aqueous Samples**

| Criteria | Action | |
|---|---|---|
| | Detects | Non-detects |
| %Solids < 10.0% | Use professional judgment | Use professional judgment |
| 10.0% < %Solids < 30.0% | Use professional judgment | Use professional judgment |
| %Solids > 30.0% | No qualification | No qualification |

## SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Sample ID:__ JC21229-1_(Scan)__ Analyte:__Benzo(a)anthracene__ RF:_1.188_

[] = (19128)(40)/(1569586)(1.188)
= 0.410 ppm Ok

DATA REVIEW WORKSHEETS

## QUANTITATION LIMITS

A. Dilution performed

| SAMPLE ID | DILUTION FACTOR | REASON FOR DILUTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

All criteria were met __N/A___
Criteria were not met
and/or see below _____

## FIELD DUPLICATE PRECISION

Sample IDs: _____-_____ Matrix:_____-_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: if large RPD (> 50 %) is observed, confirm identification of the samples and note differences. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

| COMPOUND | SQL ug/L | SAMPLE CONC. | DUPLICATE CONC. | RPD | ACTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| No field/laboratory duplicate analyzed as part of this data package. MS/MSD % recoveries RPD used to assess precision. RPD within the required criteria < 50 % for detected target analytes. | | | | | |
| | | | | | |
| | | | | | |

All criteria were met __X__
Criteria were not met
and/or see below _____

OTHER ISSUES

A. System Performance

List samples qualified based on the degradation of system performance during simple analysis:

| Sample ID | Comments | Actions |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Action:

Use professional judgment to qualify the data if it is determined that system performance has degraded during sample analyses. Inform the Contract Laboratory Program COR any action as a result of degradation of system performance which significantly affected the data.

B. Overall Assessment of Data

List samples qualified based on other issues:

| Sample ID | Comments | Actions |
|---|---|---|
| | | |
| _No_other_issues_that_required_the_need_to_qualify_the_data._Results_are_valid_and_can_be_used_for_decission_purposes._____ | | |
| | | |

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.
2. Write a brief narrative to give the user an indication of the analytical limitations of the data. Inform the Contract Laboratory COR the action, any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).
3. Sometimes, due to dilutions, re-analysis or SIM/Scan runs are being performed, there will be multiple results for a single analyte from a single sample. The following criteria and professional judgment are used to determine which result should be reported:
    - The analysis with the lower CRQL
    - The analysis with the better QC results
    - The analysis with the higher results

EXECUTIVE NARRATIVE

| | | | |
|---|---|---|---|
| SDG No: | **JC21229** | Laboratory: | **Accutest, Florida** |
| Analysis: | **SW846-8015C** | Number of Samples: | **4** |
| Location: | BMSMC, Building 5 Area<br>Humacao, PR | | |

SUMMARY: Four (4) samples were analyzed for the low molecular weight alcohols (LMWAs) list following method SW846-8015C. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

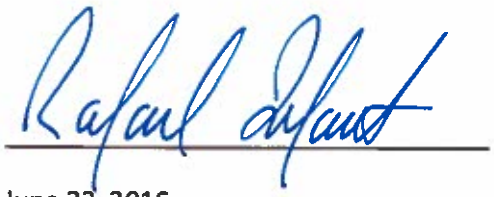
Results are valid and can be used for decision making purposes.

| | |
|---|---|
| **Critical issues:** | **None** |
| **Major:** | **None** |
| **Minor:** | **None** |

| | |
|---|---|
| **Critical findings:** | **None** |
| **Major findings:** | **None** |
| **Minor findings:** | **None** |

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: June 23, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC21229-1
Sample location: BMSMC Building 5 Area
Sampling date: 5/27/2016
Matrix: Soil

METHOD: 8015C

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| Ethanol | 120 | ug/kg | 1.0 | - | U | Yes |
| Isobutyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| Isopropyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| n-Propyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| n-Butyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| sec-Butyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| Methanol | 250 | ug/kg | 1.0 | - | U | Yes |

Sample ID: JC21229-2
Sample location: BMSMC Building 5 Area
Sampling date: 5/27/2016
Matrix: Soil

METHOD: 8015C

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| Ethanol | 120 | ug/kg | 1.0 | - | U | Yes |
| Isobutyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| Isopropyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| n-Propyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| n-Butyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| sec-Butyl Alcohol | 120 | ug/kg | 1.0 | - | U | Yes |
| Methanol | 230 | ug/kg | 1.0 | - | U | Yes |

Sample ID: JC21229-3
Sample location: BMSMC Building 5 Area
Sampling date: 5/27/2016
Matrix: Groundwater

METHOD: 8015C

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| Ethanol | 100 | ug/l | 1.0 | - | U | Yes |
| Isobutyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| Isopropyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| n-Propyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| n-Butyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| sec-Butyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| Methanol | 200 | ug/l | 1.0 | - | U | Yes |

Sample ID: JC21229-4
Sample location: BMSMC Building 5 Area
Sampling date: 5/27/2016
Matrix: AQ - Equipment Blank

METHOD: 8015C

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| Ethanol | 100 | ug/l | 1.0 | - | U | Yes |
| Isobutyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| Isopropyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| n-Propyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| n-Butyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| sec-Butyl Alcohol | 100 | ug/l | 1.0 | - | U | Yes |
| Methanol | 200 | ug/l | 1.0 | - | U | Yes |

DATA REVIEW WORKSHEETS

Project Number:___JC21229_____
Date:_____05/27/2016_____
Shipping Date:____05/27/2016_____
EPA Region:_____2_____

## REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The modified data review for VOCs included:

Lab. Project/SDG No.: __JC21229_____ Sample matrix: ___SoilGroundwater_____
No. of Samples: _____4_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:__ JC21229-4_____
Field duplicate No.:_____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Low_molecular_weight_alcohols_by_SW-846_8015C_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__June_23,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

| MISSING INFORMATION | DATE LAB. CONTACTED | DATE RECEIVED |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

All criteria were met _X_
Criteria were not met
and/or see below ____

## HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

| SAMPLE ID | DATE SAMPLED | DATE ANALYZED | pH | ACTION |
|---|---|---|---|---|
| | | | | |
| All samples analyzed within the recommended method holding time. All samples properly preserved. | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 5.6°C

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __N/A__
Criteria were not met see below _____

## GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected: _____

If mass calibration is in error, all associated data are rejected.

All criteria were met _X_
Criteria were not met
and/or see below _____

## CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/17/16_____
Dates of continuing calibration:_05/17/16 (initial);_06/01/16;_05/02/16_
Dates of final calibration verification:__06/01/16;_06/02/16_____
Instrument ID number:_____GCGH_____
Matrix/Level:_____Aqueous/low_____

| DATE | LAB FILE ID# | CRITERIA OUT RFs, %RSD, %D, r | COMPOUND | SAMPLES AFFECTED |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Note:** Initial, continuing, and final calibration verifications meets method specific criteria in at least one of the column, second column used for confirmation only.

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r < 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

| DATE ANALYZED | LAB ID | LEVEL/ MATRIX | COMPOUND | CONCENTRATION UNITS |
|---|---|---|---|---|
| | | | | |
| | | | | |
| All_method_blank_meeth_method_specific_criteria | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Field/Equipment/Trip blank

| DATE ANALYZED | LAB ID | LEVEL/ MATRIX | COMPOUND | CONCENTRATION UNITS |
|---|---|---|---|---|
| | | | | |

_No_target_analytes_dected_in_the_equipment_blank._No_field/trip_blanks_included_in_this_data_____
_package.

All criteria were met __X__
Criteria were not met
and/or see below ____

## V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

| CONTAMINATION SOURCE/LEVEL | COMPOUND | CONC/UNITS | AL/UNITS | SQL | AFFECTED SAMPLES |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

All criteria were met __X__
Criteria were not met
and/or see below _____

## SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

| SAMPLE ID | SURROGATE COMPOUND | | | | ACTION |
|---|---|---|---|---|---|
| | Hexanol | ~~DBFM~~ | ~~TOL-d8~~ | ~~BFB~~ | |

_All_surrogate_recoveries_within_laboratory_control_limits._____
_____
_____
_____
_____
_____

QC Limits* (Aqueous)
_____LL_to_UL___ _73_to_123_ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ _69_to_121__ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4 TOL-d8 = Toluene-d8
DBFM = Dibromofluoromethane BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

| QUALITY | %R < 10% | %R = 10% - LL | %R > UL |
|---|---|---|---|
| Positive results | J | J | J |
| Nondetects results | R | UJ | Accept |

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met __X___
Criteria were not met
and/or see below _____

## VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC21060-1MS/-MSD_____ Matrix/Level:____Groundwater/low_____
Sample ID:__JC21229-2MS/-MSD_____ Matrix/Level:____Soil/low_____

MS OR MSD COMPOUND % R RPD QC LIMITS ACTION

_MS/MSD_%_recoveries_and_RPD_within_laboratory_control_limits._____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

| QUALITY | %R < LL | %R > UL |
|---|---|---|
| Positive results | J | J |
| Nondetects results | R | Accept |

All criteria were met __X__
Criteria were not met
and/or see below ____

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

## VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____-_____ Matrix/Level/Unit:_____-_____

| COMPOUND | SAMPLE CONC. | MS CONC. | MSD CONC. | % RSD | ACTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

## VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? **Yes** or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

| LCS ID | COMPOUND | % R | QC LIMIT |
|---|---|---|---|

___Recoveries_within_laboratory_control_limits._____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

| QUALITY | %R < LL | %R > UL |
|---|---|---|
| Positive results | J | J |
| Nondetects results | R | Accept |

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ___N/A___
Criteria were not met
and/or see below _____

## IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: _____-_____ Matrix:_____-_____

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

| COMPOUND | SQL | SAMPLE CONC. | DUPLICATE CONC. | RPD | ACTION |
|---|---|---|---|---|---|
| | | | | | |
| No field/laboratory duplicate analyzed with this data package. MS/MSD % recoveries RPD used to assess precision. RPD within laboratory, generally acceptable and guidance document performance criteria control limits. | | | | | |
| | | | | | |
| | | | | | |

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

## X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

| DATE | SAMPLE ID | IS OUT | IS AREA | ACCEPTABLE RANGE | ACTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

| QUALITY | IS AREA < -25% | IS AREA = -25 % TO – 50% | IS AREA > + 100% |
|---|---|---|---|
| Positive results | J | J | J |
| Nondetected results | R | UJ | ACCEPT |

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below ____

## XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC21229-1

Hexanol RF = 67.60

[ ] = (288217)/(67.60)

= 4,264 ppm OK

All criteria were met __X__
Criteria were not met
and/or see below _____

## XII. QUANTITATION LIMITS

### A. Dilution performed

| SAMPLE ID | DILUTION FACTOR | REASON FOR DILUTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

### B. Percent Solids

List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)

EXECUTIVE NARRATIVE

| | | | |
|---|---|---|---|
| SDG No: | **JC21229** | Laboratory: | **Accutest, New Jersey** |
| Analysis: | **SW846-8081B** | Number of Samples: | **4** |

Location: BMSMC, Building 5 Area
Humacao, PR

SUMMARY: Four (4) sample was analyzed for selected pesticides following method SW846-8081B. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Results are valid and can be used for decision making purposes.

| | |
|---|---|
| **Critical issues:** | **None** |
| **Major:** | **None** |
| **Minor:** | **None** |

| | |
|---|---|
| **Critical findings:** | **None** |
| **Major findings:** | **None** |
| **Minor findings:** | **None** |

COMMENTS: Results are valid and can be used for decision making purposes.

Reviewers Name: Rafael Infante
Chemist License 1888

Signature: 

Date: June 23, 2016

SAMPLE ORGANIC DATA SAMPLE SUMMARY

Sample ID: JC21229-1
Sample location: BMSMC Building 5 Area
Sampling date: 27-May-16
Matrix: Soil

METHOD: 8081B

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| Aldrin | 0.84 | ug/kg | 1 | - | U | Yes |
| alpha-BHC | 0.84 | ug/kg | 1 | - | U | Yes |
| beta-BHC | 0.84 | ug/kg | 1 | - | U | Yes |
| delta-BHC | 0.84 | ug/kg | 1 | - | U | Yes |
| gamma-BHC (Lindane) | 0.84 | ug/kg | 1 | - | U | Yes |
| alpha-Chlordane | 0.84 | ug/kg | 1 | - | U | Yes |
| gamma-Chlordane | 0.84 | ug/kg | 1 | - | U | Yes |
| Dieldrin | 0.84 | ug/kg | 1 | - | U | Yes |
| 4,4'-DDD | 0.84 | ug/kg | 1 | - | U | Yes |
| 4,4'-DDE | 0.84 | ug/kg | 1 | - | U | Yes |
| 4,4'-DDT | 0.84 | ug/kg | 1 | - | U | Yes |
| Endrin | 0.84 | ug/kg | 1 | - | U | Yes |
| Endosulfan sulfate | 0.84 | ug/kg | 1 | - | U | Yes |
| Endrin aldehyde | 0.84 | ug/kg | 1 | - | U | Yes |
| Endosulfan-I | 0.84 | ug/kg | 1 | - | U | Yes |
| Endosulfan-II | 0.84 | ug/kg | 1 | - | U | Yes |
| Heptachlor | 0.84 | ug/kg | 1 | - | U | Yes |
| Heptachlor epoxide | 0.84 | ug/kg | 1 | - | U | Yes |
| Methoxychlor | 1.7 | ug/kg | 1 | - | U | Yes |
| Endrin ketone | 0.84 | ug/kg | 1 | - | U | Yes |
| Toxaphene | 21 | ug/kg | 1 | - | U | Yes |

Sample ID: JC21229-2
Sample location: BMSMC Building 5 Area
Sampling date: 27-May-16
Matrix: Soil

METHOD: 8081B

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| Aldrin | 0.74 | ug/kg | 1 | - | U | Yes |
| alpha-BHC | 0.74 | ug/kg | 1 | - | U | Yes |
| beta-BHC | 0.74 | ug/kg | 1 | - | U | Yes |
| delta-BHC | 0.74 | ug/kg | 1 | - | U | Yes |
| gamma-BHC (Lindane) | 0.74 | ug/kg | 1 | - | U | Yes |
| alpha-Chlordane | 0.74 | ug/kg | 1 | - | U | Yes |
| gamma-Chlordane | 0.74 | ug/kg | 1 | - | U | Yes |
| Dieldrin | 0.74 | ug/kg | 1 | - | U | Yes |
| 4,4'-DDD | 0.74 | ug/kg | 1 | - | U | Yes |
| 4,4'-DDE | 0.74 | ug/kg | 1 | - | U | Yes |
| 4,4'-DDT | 0.74 | ug/kg | 1 | - | U | Yes |
| Endrin | 0.74 | ug/kg | 1 | - | U | Yes |
| Endosulfan sulfate | 0.74 | ug/kg | 1 | - | U | Yes |
| Endrin aldehyde | 0.74 | ug/kg | 1 | - | U | Yes |
| Endosulfan-I | 0.74 | ug/kg | 1 | - | U | Yes |
| Endosulfan-II | 0.74 | ug/kg | 1 | - | U | Yes |
| Heptachlor | 0.74 | ug/kg | 1 | - | U | Yes |
| Heptachlor epoxide | 0.74 | ug/kg | 1 | - | U | Yes |
| Methoxychlor | 1.5 | ug/kg | 1 | - | U | Yes |
| Endrin ketone | 0.74 | ug/kg | 1 | - | U | Yes |
| Toxaphene | 18 | ug/kg | 1 | - | U | Yes |

Sample ID: JC21229-3
Sample location: BMSMC Building 5 Area
Sampling date: 27-May-16
Matrix: Groundwater

METHOD: 8081B

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| Aldrin | 0.010 | ug/L | 1 | - | U | Yes |
| alpha-BHC | 0.010 | ug/L | 1 | - | U | Yes |
| beta-BHC | 0.010 | ug/L | 1 | - | U | Yes |
| delta-BHC | 0.010 | ug/L | 1 | - | U | Yes |
| gamma-BHC (Lindane) | 0.010 | ug/L | 1 | - | U | Yes |
| alpha-Chlordane | 0.010 | ug/L | 1 | - | U | Yes |
| gamma-Chlordane | 0.010 | ug/L | 1 | - | U | Yes |
| Dieldrin | 0.010 | ug/L | 1 | - | U | Yes |
| 4,4'-DDD | 0.010 | ug/L | 1 | - | U | Yes |
| 4,4'-DDE | 0.010 | ug/L | 1 | - | U | Yes |
| 4,4'-DDT | 0.010 | ug/L | 1 | - | U | Yes |
| Endrin | 0.010 | ug/L | 1 | - | U | Yes |
| Endosulfan sulfate | 0.010 | ug/L | 1 | - | U | Yes |
| Endrin aldehyde | 0.010 | ug/L | 1 | - | U | Yes |
| Endrin ketone | 0.010 | ug/L | 1 | - | U | Yes |
| Endosulfan-I | 0.010 | ug/L | 1 | - | U | Yes |
| Endosulfan-II | 0.010 | ug/L | 1 | - | U | Yes |
| Heptachlor | 0.010 | ug/L | 1 | - | U | Yes |
| Heptachlor epoxide | 0.010 | ug/L | 1 | - | U | Yes |
| Methoxychlor | 0.020 | ug/L | 1 | - | U | Yes |
| Toxaphene | 0.26 | ug/L | 1 | - | U | Yes |

Sample ID: JC21229-4
Sample location: BMSMC Building 5 Area
Sampling date: 27-May-16
Matrix: AQ - Equipment Blank

METHOD: 8081B

| Analyte Name | Result | Units | Dilution Factor | Lab Flag | Validation | Reportable |
|---|---|---|---|---|---|---|
| Aldrin | 0.011 | ug/L | 1 | - | U | Yes |
| alpha-BHC | 0.011 | ug/L | 1 | - | U | Yes |
| beta-BHC | 0.011 | ug/L | 1 | - | U | Yes |
| delta-BHC | 0.011 | ug/L | 1 | - | U | Yes |
| gamma-BHC (Lindane) | 0.011 | ug/L | 1 | - | U | Yes |
| alpha-Chlordane | 0.011 | ug/L | 1 | - | U | Yes |
| gamma-Chlordane | 0.011 | ug/L | 1 | - | U | Yes |
| Dieldrin | 0.011 | ug/L | 1 | - | U | Yes |
| 4,4'-DDD | 0.011 | ug/L | 1 | - | U | Yes |
| 4,4'-DDE | 0.011 | ug/L | 1 | - | U | Yes |
| 4,4'-DDT | 0.011 | ug/L | 1 | - | U | Yes |
| Endrin | 0.011 | ug/L | 1 | - | U | Yes |
| Endosulfan sulfate | 0.011 | ug/L | 1 | - | U | Yes |
| Endrin aldehyde | 0.011 | ug/L | 1 | - | U | Yes |
| Endrin ketone | 0.011 | ug/L | 1 | - | U | Yes |
| Endosulfan-I | 0.011 | ug/L | 1 | - | U | Yes |
| Endosulfan-II | 0.011 | ug/L | 1 | - | U | Yes |
| Heptachlor | 0.011 | ug/L | 1 | - | U | Yes |
| Heptachlor epoxide | 0.011 | ug/L | 1 | - | U | Yes |
| Methoxychlor | 0.022 | ug/L | 1 | - | U | Yes |
| Toxaphene | 0.28 | ug/L | 1 | - | U | Yes |

DATA REVIEW WORKSHEETS

Project/Case Number:_____JC21229___
Sampling Date:____May_27,_2016____
Shipping Date:____May_27,_2016_____
EPA Region No.:_____2_____

## REVIEW OF PESTICIDE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Hazardous Waste Support Section SOP No. HW-36A, Revision 0, June, 2015. SOM02.2. Pesticide Data Validation.* The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JC21229_____ Sample matrix: ___Soil/Groundwater___
No. of Samples: _____4_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:_____MC21229-4_____
Field duplicate No.:_____-_____
Field spikes No.:_____-_____
QC audit samples:_____-_____

___X___ Data Completeness
___X___ Holding Times
__N/A__ GC/MS Tuning
___X__ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
__X____ Laboratory Control Spikes
__X____ Field Duplicates
__X____ Calibrations
__X____ Compound Identifications
__X____ Compound Quantitation
__X____ Quantitation Limits

Overall Comments:__TCL_pesticides_list_by_SW846-8081B_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated not detect

Reviewer:_____
Date:__June_23,_2016_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

| MISSING INFORMATION | DATE LAB. CONTACTED | DATE RECEIVED |
|---|---|---|

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

| SAMPLE ID | DATE SAMPLED | DATE EXTRACTED/ANALYZED | ACTION |
|---|---|---|---|
| Samples properly preserved. | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Preservatives: All samples extracted and analyzed within the required criteria.

Criteria

Aqueous samples - seven (7) days from sample collection for extraction; 40 days from sample collection for analysis.
Non-aqueous samples – fourteen (14) days from sample collection for extraction; 40 days from sample collection for analysis.

Cooler temperature (Criteria: 4 ± 2 °C): 5.6°C - OK

Actions

**Qualify aqueous sample results using preservation and technical holding time information as follows:**

a. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed within the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).

b. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ).

c. If the samples were properly preserved, and were extracted and analyzed within the technical holding times, no qualification of the data is necessary.

d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding times, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.

e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

**Qualify non-aqueous sample results using preservation and technical holding time information as follows:**

a. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed within the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).

b. If there is no evidence that the samples were properly preserved (T = 4°C ± 2°C), and the samples were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ).

c. If the samples were properly preserved, and were extracted and analyzed within the technical holding time, no qualification of the data is necessary.

d. If the samples were properly preserved, and were extracted or analyzed outside the technical holding time, qualify detects as estimated (J) and non-detects as estimated (UJ). Note in the Data Review Narrative that holding times were exceeded and the effect of exceeding the holding time on the resulting data.

e. Use professional judgment to qualify samples whose temperature upon receipt at the laboratory is either below 2 degrees centigrade or above 6 degrees centigrade.
f. If technical holding times are grossly exceeded, use professional judgment to qualify the data.

All criteria were met ___X___
Criteria were not met see below _____

GAS CHROMATOGRAPH WITH ELECTRON CAPTURE DETECTOR (GC/ECD) INSTRUMENT PERFORMANCE CHECK (SECTIONS 1 TO 5)

**1. Resolution Check Mixture**

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? **Yes**? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 60.0%? Yes? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

**2. Performance Evaluation Mixture (PEM) Resolution Criteria**

Criteria

Is PEM analysis performed at the required frequency (at the end of each pesticide initial calibration sequence and every 12 hours)? **Yes**? or No?

Action

a. If PEM is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

Criteria

Is PEM % Resolution < 90%? Yes? or **No?**

Action

a. a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

All criteria were met ___X___
Criteria were not met see below ____

**3. PEM 4,4'-DDT Breakdown**

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or **No**?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or **No**?

Action

a. Qualify non-detects for 4,4'- DDT as unusable (R )
b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

**4. PEM Endrin Breakdown**

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or **No**?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or **No**?

Action

a. Qualify non-detects for Endrin as unusable (R )
b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
c. Qualify detects for Endrin ketone as tentatively identified (NJ)

All criteria were met __X__
Criteria were not met see below ____

**5. Mid-point Individual Standard Mixture Resolution -**

Criteria

Is the resolution between two adjacent peaks in the Resolution Check Mixture C greater than or equal to 80.0% for all analytes for the primary column and greater than or equal to 50.0% for the confirmation column? **Yes**? or No?

Is the resolution between two adjacent peaks in the Resolution Check Mixture (A and B) greater than or equal to 90.0%? **Yes**? or No?

Note: If resolution criteria are not met, the quantitative results may not be accurate due to inadequate resolution. Qualitative identifications may also be questionable if coelution exists.

Action

a. Qualify detects for target compounds that were not adequately resolved as tentatively identified (NJ).
b. Qualify non-detected compounds as unusable (R).

Criteria

Is mid-point individual standard mixture analysis performed at the required frequency (every 12 hours)? **Yes**? or No?

Action

a. If the mid-point individual standard mixture analysis is not performed at the required frequency, qualify all associated sample and blank results as unusable (R).

All criteria were met _X_____
Criteria were not met
and/or see below _____

## CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/16/16_____
Dates of initial calibration verification:_05/16/16_____
Dates of continuing calibration:_05/31/16;_06/01/16;_06/02/16;_06/03/16_____
Dates of final calibration_____05/31/16;_ 06/01/16;_06/02/16;_06/03/16_____
Instrument ID numbers:_____GC1G_____
Matrix/Level:_____Aqueous/low_____

Date of initial calibration:_____05/24/16:_____06/06/16_____
Dates of initial calibration verification:_05/24/16_____06/06/16_____
Dates of continuing calibration:_____06/02/16;_____06/07/16_____
Dates of final calibration_____06/02/16;_____06/07/16_____
Instrument ID numbers:_____GC4G_____
Matrix/Level:_____Aqueous/low_____

| DATE | LAB FILE ID# | CRITERIA OUT RFs, %RSD, %D, r | COMPOUND | SAMPLES AFFECTED |
|---|---|---|---|---|
| GC1G | | | | |
| 05/31/16 | cc3988-50 | 29.8/26.8 | Endrin ketone | JC21229-3; -4 |
| | | | | |
| Initial and initial calibration verification within the guidance document performance criteria. Continuing calibration % differences meet the performance criteria in at least one of the two columns except in the cases described in this document. Final calibration verification included in data. % differences meet the performance criteria in at least one of the two columns. | | | | |
| | | | | |
| | | | | |

**Note:** No action taken on samples JC21229-3 and JC21229-4, samples re-tested on 06/03/16. No qualification required.

Criteria

Are a five point calibration curve delivered with concentration levels as shown in Table 3 of SOP HW-36A, Revision 0, June, 2015? Yes? or No?

Actions

If the standard concentrations listed in Table 3 are not used, use professional judgment to evaluate the effect on the data

Criteria

Are RT Windows calculated correctly? Yes? or No?

Action

Recalculate the windows and use the corrected values for all evaluations.

Criteria

Are the Percent Relative Standard Deviation (%RSD) of the CFs for each of the single component target compounds less than or equal to 20.0%, except for alpha-BHC and delta-BHC?
Yes? or No?

Are the %RSD of the CFs for alpha-BHC and delta-BHC less than or equal to 25.0%. Yes? or No?

Is the %RSD of the CFs for each of the Toxaphene peaks must be < 30% when 5-point ICAL is performed? Yes? or No?

Is the %RSD of the CFs for the two surrogates (tetrachloro-m-xylene and decachlorobiphenyl) less than or equal to 30.0%. Yes? or No?

Action

a. If the %RSD criteria are not met, qualify detects as estimated (J) and use professional judgment to qualify non-detected target compounds.
b. If the %RSD criteria are within allowable limits, no qualification of the data is necessary

**Continuing Calibration Checks**

Criteria

Is the continuing calibration standard analyzed at the acceptable time intervals? Yes? or No?

Action

a. If more than 14 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of either a PEM or mid-point concentration of the Individual Standard Mixtures (A and B) or (C), qualify all data as unusable (R).
b. If more than 12 hours has elapsed from the injection of the instrument blank that begins an analytical sequence (opening CCV) and the injection of the last sample or blank that is part of the same analytical sequence, qualify all data as unusable (R).
c. If more than 72 hours has elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene Calibration Verification Standard (CS3), qualify all data as unusable (R).

All criteria were met __X__
Criteria were not met
and/or see below _____

Criteria

Is the Percent Difference (%D) within ±25.0% for the PEM sample? Yes? or **No**?

Action
a. Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

Criteria

For the Calibration Verification Standard (CS3); is the Percent Difference (%D) within ±25.0%?
Yes? or **No**?

Action

Qualify associated detects as estimated (J) and non-detects as estimated (UJ).

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is detected? Yes? or **No**?

Action

a. Qualify detects for 4,4'-DDT; detects for 4,4'-DDD; and detects for 4,4'-DDE as estimated (J)
b. Non-detected associated compounds are not qualified

Criteria

Is the PEM 4,4'-DDT % Breakdown >20.0% and 4,4'-DDT is not detected Yes? or **No**?

Action

a. Qualify non-detects for 4,4'- DDT as unusable (R )
b. Qualify detects for 4,4'-DDD as tentatively identified (NJ)
c. Qualify detects for 4,4'-DDE as tentatively identified (NJ)

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is detected? Yes? or **No**?

Action

a. Qualify detects for Endrin; detects for Endrin aldehyde; and detects for Endrin ketone as estimated (J)
b. Non-detected associated compounds are not qualified

Criteria

Is the PEM Endrin % Breakdown >20.0% and Endrin is not detected Yes? or **No**?

Action

a. Qualify non-detects for Endrin as unusable (R )
b. Qualify detects for Endrin aldehyde as tentatively identified (NJ)
c. Qualify detects for Endrin ketone as tentatively identified (NJ)

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

CRQL concentration_____N/A_____

Laboratory blanks

| DATE ANALYZED | LAB ID | LEVEL/ MATRIX | COMPOUND | CONCENTRATION UNITS |
|---|---|---|---|---|
| No_target_analytes_detected_in_method_blanks_at_a_reporting_limit_of_0.01_and_0.001_ug/L. | | | | |

Field/Equipment/Trip blank

| DATE ANALYZED | LAB ID | LEVEL/ MATRIX | COMPOUND | CONCENTRATION UNITS |
|---|---|---|---|---|
| No_target_analytes_detected_in_the_equipment_blank._No_field/trip_blanks_analyzed_with_this_data_package. | | | | |

All criteria were met __X__
Criteria were not met
and/or see below _____

BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

The concentration of non-target compounds in all blanks must be less than or equal to 10 µg/L. The concentration of each target compound found in the method or field blanks must be less than its CRQL listed in the method.

Data concerning the field blanks are not evaluated as part of the CCS process. If field blanks are present, the data reviewer should evaluate this data in a similar fashion as the method blanks.

Specific actions are as follows:

**Blank Actions for Pesticide Analyses**

| Blank Type | Blank Result | Sample Result | Action for Samples |
|---|---|---|---|
| Method, Sulfur Cleanup, Instrument, Field, TCLP/SPLP | Detects | Not detected | No qualification required |
| | < CRQL | < CRQL | Report CRQL value with a U |
| | | ≥ CRQL | No qualification required |
| | > CRQL | < CRQL | Report CRQL value with a U |
| | | ≥ CRQL and ≤ blank concentration | Report blank value for sample concentration with a U |
| | | ≥ CRQL and > blank concentration | No qualification required |
| | = CRQL | ≤ CRQL | Report CRQL value with a U |
| | | > CRQL | No qualification required |
| | Gross contamination | Detects | Report blank value for sample concentration with a U |

DATA REVIEW WORKSHEETS

All criteria were met __X__
Criteria were not met
and/or see below _____

| CONTAMINATION SOURCE/LEVEL | COMPOUND | CONC/UNITS | AL/UNITS | SQL | AFFECTED SAMPLES |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

All criteria were met __X__
Criteria were not met
and/or see below ____

## SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.

Matrix:_Aqueous_____

| Lab Sample ID | Lab File ID | S1 a | S1 b | S2 a | S2 b |
|---|---|---|---|---|---|
| JC21229-3 | 1G123741.D | 117 | 117 | 69 | 81 |
| JC21229-3 | 1G123821.D | 91 | 88 | 46 | 52 |
| JC21229-4 | 1G123826.D | 100 | 89 | 50 | 54 |
| OP94349-BS1 | 1G123693.D | 118 | 115 | 105 | 131* c |
| OP94349-BSD | 1G123710.D | 79 | 79 | 83 | 93 |
| OP94349-MB1 | 1G123746.D | 104 | 95 | 124* c | 131* c |
| OP94431-BS1 | 1G123820.D | 86 | 85 | 84 | 93 |
| OP94431-MB1 | 1G123819.D | 96 | 87 | 87 | 92 |
| OP94431-MS | 1G123827.D | 90 | 83 | 34 | 38 |
| OP94431-MSD | 1G123828.D | 95 | 87 | 33 | 37 |

| Surrogate Compounds | Recovery Limits |
|---|---|
| S1 = Tetrachloro-m-xylene | 26-132% |
| S2 = Decachlorobiphenyl | 10-118% |

(a) Recovery from GC signal #1
(b) Recovery from GC signal #2
(c) Outside the QC limits.

**Note:** Surrogate recoveries within laboratory control limits except in the cases described in this document. No action taken, QC sample (method blank) not qualified.

DATA REVIEW WORKSHEETS

Matrix:_Soil_____

| Lab Sample ID | Lab File ID | S1 a | S1 b | S2 a | S2 b |
|---|---|---|---|---|---|
| JC21229-1 | 4G68955.D | 83 | 75 | 84 | 74 |
| JC21229-2 | 4G68956.D | 87 | 78 | 98 | 89 |
| OP94393-BS1 | 4G68826.D | 70 | 71 | 98 | 59 |
| OP94393-MB1 | 4G68825.D | 81 | 79 | 117 | 65 |
| OP94393-MS | 4G68833.D | 70 | 64 | 85 | 72 |
| OP94393-MSD | 4G68834.D | 63 | 57 | 65 | 57 |

| Surrogate Compounds | Recovery Limits |
|---|---|
| S1 = Tetrachloro-m-xylene | 24-136% |
| S2 = Decachlorobiphenyl | 10-153% |

(a) Recovery from GC signal #1
(b) Recovery from GC signal #2

**Note:** Surrogate recoveries within laboratory control limits.

Actions:

a. For any surrogate recovery greater than 150%, qualify detected target compounds as biased high (J+).
b. Do not qualify non-detected target compounds for surrogate recovery > 150 %.
c. If both surrogate recoveries are greater than or equal to 30% and less than or equal to 150%, no qualification of the data is necessary.
d. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify detected target compounds as biased low (J-).
e. For any surrogate recovery greater than or equal to 10% and less than 30%, qualify non-detected target compounds as approximated (UJ).
f. If low surrogate recoveries are from sample dilution, professional judgment should be used to determine if the resulting data should be qualified. If sample dilution is not a factor:
    i. Qualify detected target compounds as biased low (J-).
    ii. Qualify non-detected target compounds as unusable (R).
g. If surrogate RTs in PEMs, Individual Standard Mixtures, samples, and blanks are outside of the RT Windows, the reviewer must use professional judgment to qualify data.
h. If surrogate RTs are within RT windows, no qualification of the data is necessary.
i. If the two surrogates were not added to all samples, MS/MSDs, standards, LCSs, and blanks, use professional judgment in qualifying data as missing surrogate analyte may not directly apply to target analytes.

Summary Surrogate Actions for Pesticide Analyses

| Criteria | Action* | |
|---|---|---|
| | Detected Target Compounds | Non-detected Target Compounds |
| %R > 150% | J+ | No qualification |
| 30% < %R < 150% | No qualification | |
| 10% < %R < 30% | J- | UJ |
| %R < 10% (sample dilution not a factor) | J- | R |
| %R < 10% (sample dilution is a factor) | Use professional judgment | |
| RT out of RT window | Use professional judgment | |
| RT within RT window | No qualification | |

* Use professional judgment in qualifying data, as surrogate recovery problems may not directly apply to target analytes.

All criteria were met ___X___
Criteria were not met
and/or see below _____

## MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

Data for MS and MSDs will not be present unless requested by the Region.
Notify the Contract Laboratory Program Project Officer (CLP PO) if a field blank was used for the MS and MSD, unless designated as such by the Region.

> **NOTE:** For a Matrix Spike that does not meet criteria, apply the action to only the field sample used to prepare the Matrix Spike sample. If it is clearly stated in the data validation materials that the samples were taken through incremental sampling or some other method guaranteeing the homogeneity of the sample group, then the entire sample group may be qualified.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:___JC21223-27_____ Matrix/Level:_____Soil____
Sample ID:___JC21247-3_____ Matrix/Level:___Aqueous__

| MS OR MSD | COMPOUND | % R | RPD | QC LIMITS | ACTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Note:** MS/MSD % recoveries and RPD within laboratory control limits.

Action

No qualification of the data is necessary on MS and MSD data alone. However, using professional judgment, the validator may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

## LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

| LCS Spike Compound | Recovery Limits (%) |
|---|---|
| gamma-BHC | 50 – 120 |
| Heptachlor epoxide | 50 – 150 |
| Dieldrin | 30 – 130 |
| 4,4'-DDE | 50 – 150 |
| Endrin | 50 – 120 |
| Endosulfan sulfate | 50 – 120 |
| trans-Chlordane | 30 – 130 |
| Tetrachloro-m-xylene (surrogate) | 30 – 150 |
| Decachlorobiphenyl (surrogate) | 30 – 150 |

LCS concentrations:____0.25_ug/l;_16.7_ug/kg_____

List the %R of compounds which do not meet the criteria

| LCS ID | COMPOUND | % R | QC LIMIT |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Note:** RPD for Aldrin exceed in-house control limits for blank spike/blank spike duplicate. No action taken. No qualification made on RPD results, professional judgment.

Action

The following guidance is suggested for qualifying sample data for which the associated LCS does not meet the required criteria.

a. If the LCS recovery exceeds the upper acceptance limit, qualify detected target compounds as estimated (J). Do not qualify non-detected target compounds.

b. If the LCS recovery is less than the lower acceptance limit, qualify detected target compounds as estimated (J) and non-detects as unusable (R).

c. Use professional judgment to qualify data for compounds other than those compounds that are included in the LCS.

d. Use professional judgment to qualify non-LCS compounds. Take into account the compound class, compound recovery efficiency, analytical problems associated with each compound, and comparability in the performance of the LCS compound to the non-LCS compound.
e. If the LCS recovery is within allowable limits, no qualification of the data is necessary.

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? **Yes** or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

**Note:** Blank spike/blank spike duplicate analyzed for aqueous matrices. % recoveries and RPD within laboratory control limits.

All criteria were met _____
Criteria were not met
and/or see below __N/A____

FLORISIL CARTRIDGE PERFORMANCE CHECK

NOTE: Florisil cartridge cleanup is mandatory for all extracts.

Criteria

Is the Florisil cartridge performance check conducted at least once on each lot of cartridges used for sample cleanup or every 6 months, whichever is most frequent? Yes? or No?

Criteria

Are the results for the Florisil Cartridge Performance Check solution included with the data package? Yes? or No?

Note: If % criteria are not met, examine the raw data for the presence of polar interferences and use professional judgment in qualifying the data as follows:

Action:

a. If the Percent Recovery is greater than 120% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.
b. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
c. If the Percent Recovery is greater than or equal to 10% and less than 80% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
d. If the Percent Recovery is less than 10% for any of the pesticide target compounds in the Florisil Cartridge Performance Check, qualify detected compounds as estimated (J) and qualify non-detected target compounds as unusable (R).
e. If the Percent Recovery of 2,4,5-trichlorophenol in the Florisil Cartridge Performance Check is greater than or equal to 5%, use professional judgment to qualify detected and non-detected target compounds, considering interference on the sample chromatogram.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the Florisil Cartridge Performance Check analysis not yielding acceptable results.

**Note:_ No information for florisil cartridge performance check included in data package. There is evidence that Florisil cartridges were used for sample extraction/clean-up. No qualification of the data performed, professional judgment.**

All criteria were met __N/A____
Criteria were not met
and/or see below _____

GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

NOTE: GPC cleanup is mandatory for all soil samples.

If GPC criteria are not met, examine the raw data for the presence of high molecular weight contaminants; examine subsequent sample data for unusual peaks; and use professional judgment in qualifying the data. Notify the Contract Laboratory Program Project Officer (CLP PO) if the laboratory chooses to analyze samples under unacceptable GPC criteria.

Action:

a. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, the non-detected target compounds may be suspect, qualify detected compounds as estimated (J).
b. If the Percent Recovery is less than 10% for the pesticide compounds and surrogates during the GPC calibration check, qualify all non-detected target compounds as unusable (R).
c. If the Percent Recovery is greater than or equal to 10% and is less than 80% for any of the pesticide target compounds in the GPC calibration, qualify detected target compounds as estimated (J) and non-detected target compounds as approximated (UJ).
d. If the Percent Recovery is greater than or equal to 80% and less than or equal to 120% for all the pesticide target compounds, no qualification of the data is necessary.
e. If high recoveries (i.e., greater than 120%) were obtained for the pesticides and surrogates during the GPC calibration check, qualify detected compounds as estimated (J). Do not qualify non-detected target compounds.

Note: State in the Data Review Narrative potential effects on the sample data resulting from the GPC cleanup analyses not yielding acceptable results.

**Note:_ No information for performance of GPC cleanup included in data package. No qualification of the data performed, professional judgment.**

All criteria were met __X__
Criteria were not met
and/or see below _____

TARGET COMPOUND IDENTIFICATION

Criteria:

1. Is Retention Times (RTs) of both of the surrogates and reported target compounds in each sample within the calculated RT Windows on both columns? **Yes**? or No?

2. Is the Tetrachloro-m-xylene (TCX) RT ±0.05 minutes of the Mean RT (RT) determined from the initial calibration and Decachlorobiphenyl (DCB) within ±0.10 minutes of the RT determined from the initial calibration? **Yes**? or No?

3. Is the Percent Difference (%D) for the detected mean concentrations of a pesticide target compound between the two Gas Chromatograph (GC) columns within the inclusive range of ± 25.0 %? **Yes**? or No?

4. When no analytes are identified in a sample; are the chromatograms from the analyses of the sample extract and the low-point standard of the initial calibration associated with those analyses on the same scaling factor? **Yes**? or No?

5. Does the chromatograms display the Single Component Pesticides (SCPs) detected in the sample and the largest peak of any multi-component analyte detected in the sample at less than full scale. Yes? or **No**?

6. If an extract is diluted; does the chromatogram display SCPs peaks between 10-100% of full scale, and multi-component analytes between 25-100% of full scale? Yes? or No?

7. For any sample; does the baseline of the chromatogram return to below 50% of full scale before the elution time of alpha-BHC, and also return to below 25% of full scale after the elution time of alpha-BHC and before the elution time of DCB? **Yes**? or No?

8. If a chromatogram is replotted electronically to meet these requirements; is the scaling factor used displayed on the chromatogram, and both the initial chromatogram and the replotted chromatogram submitted in the data package. Yes? or **No**?

**Action:**

a. If the qualitative criteria for both columns were not met, all target compounds that are reported as detected should be considered non-detected.

b. Use professional judgment to assign an appropriate quantitation limit using the following guidance:

i. If the detected target compound peak was sufficiently outside the pesticide RT Window, the reported values may be a false positive and should be replaced with the sample Contract Required Quantitation Limits (CRQL) value.

ii. If the detected target compound peak poses an interference with potential detection of another target peak, the reported value should be considered and qualified as unusable (R).

c. If the data reviewer identifies a peak in both GC column analyses that falls within the appropriate RT Windows, but was reported as a non-detect, the compound may be a false negative. Use professional judgment to decide if the compound should be included.

Note: State in the Data Review Narrative all conclusions made regarding target compound identification.

d. If the Toxaphene peak RT windows determined from the calibration overlap with SCPs or chromatographic interferences, use professional judgment to qualify the data.

e. If target compounds were detected on both GC columns, and the Percent Difference between the two results is greater than 25.0%, consider the potential for coelution and use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, use professional judgment to determine how best to report, and if necessary, qualify the data according to these guidelines.

f. If Toxaphene exhibits a marginal pattern-matching quality, use professional judgment to establish whether the differences are due to environmental "weathering" (i.e., degradation of the earlier eluting peaks relative to the later eluting peaks). If the presence of Toxaphene is strongly suggested, report results as presumptively present (N).

GAS CHROMATOGRAPH/MASS SPECTROMETER (GC/MS) CONFIRMATION

NOTE: This confirmation is not usually provided by the laboratory. In cases where it is provided, use professional judgment to determine if data qualified with "C" can be salvaged if it was previously qualified as unusable (R).

Action:

a. If the quantitative criteria for both columns were met (≥ 5.0 ng/µL for SCPs and ≥ 125 ng/µL for Toxaphene), determine whether GC/MS confirmation was performed. If it was performed, qualify the data using the following guidance:

i. If GC/MS confirmation was not required because the quantitative criteria for both columns was not met, but it was still performed, use professional judgment when evaluating the data to decide whether the detect should be qualified with "C".

ii. If GC/MS confirmation was performed, but unsuccessful for a target compound detected by GC/ECD analysis, qualify those detects as "X".

All criteria were met ___X___
Criteria were not met
and/or see below _____

COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC21229-1 Decachlorobiphenyl RF = 0.744

[ ] = $(254.3 \times 10^6)(50)/(502.0 \times 10^6)(0.744)$
= 33.7 ppb Ok

Action:

a. If sample quantitation is different from the reported value, qualify result as unusable (R).
b. When a sample is analyzed at more than one dilution, the lowest CRQLs are used unless a QC exceedance dictates the use of the higher CRQLs from the diluted sample.
c. Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its corresponding value on the original reporting form and substituting the data from the diluted sample.
d. Results between the MDL and CRQL should be qualified as estimated (J).
e. Results less than the MDL should be reported at the CRQL and qualified (U). MDLs themselves are not reported.
f. For non-aqueous samples, if the percent moisture is less than 70.0%, no qualification of the data is necessary. If the percent moisture is greater than or equal to 70.0% and less than 90.0%, qualify detects as estimated (J) and non-detects as approximated (UJ). If the percent moisture is greater than or equal to 90.0%, qualify detects as estimated (J) and non-detects as unusable (R) (see Table).

**Percent Moisture Actions for Pesticide Analysis for Non-Aqueous Samples**

| Criteria | Action | |
|---|---|---|
| | Detected Associated Compounds | Non-detected Associated Compounds |
| % Moisture < 70.0 | No qualification | |
| 70.0 < % Moisture < 90.0 | J | UJ |
| % Moisture > 90.0 | J | R |

List samples which have ≤ 50 % solids

Note: If any discrepancies are found, the Region's designated representative may contact the laboratory to obtain additional information that could resolve any differences. If a discrepancy remains unresolved, the reviewer must use professional judgment to decide which value is the most accurate. Under these circumstances, the reviewer may determine that qualification of data is warranted. Note in the Data Review Narrative a description of the reasons for data qualification and the qualification that is applied to the data.

Dilution performed

| SAMPLE ID | DILUTION FACTOR | REASON FOR DILUTION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

All criteria were met __N/A___
Criteria were not met
and/or see below _____

## FIELD DUPLICATE PRECISION

NOTE: In the absence of QAPP guidance for validating data from field duplicates, the following action will be taken.

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples. Identify which samples within the data package are field duplicates. Estimate the relative percent difference (RPD) between the values for each compound. If large RPDs (> 50%) is observed, confirm identification of samples and note difference in the executive summary.

Sample IDs: _____-_____ Matrix:_____-_____

| COMPOUND | SQL ug/L | SAMPLE CONC. | DUPLICATE CONC. | RPD | ACTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| No field/laboratory duplicate analyzed with this data package. LCS/LCSD % recoveries RPD used to assess precision. RPD within the required criteria of < 50 %. | | | | | |
| | | | | | |
| | | | | | |

Actions:

a. Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

b. If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

i. If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

ii. If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

iii. If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

iv. If both sample and duplicate results are not detected, no action is needed.

## OVERALL ASSESSMENT OF DATA

Action:

1. Use professional judgment to determine if there is any need to qualify data which were not qualified based on the Quality Control (QC) criteria previously discussed.

2. Write a brief narrative to give the user an indication of the analytical limitations of the data.

Note: The Contract Laboratory Program Project Officer (CLP PO) must be informed if any inconsistency of the data with the Sample Delivery Group (SDG) Narrative. If sufficient information on the intended use and required quality of the data is available, the reviewer should include their assessment of the usability of the data within the given context. This may be used as part of a formal Data Quality Assessment (DQA).

**Overall assessment of the data:** Results are valid; the data can be used for decision making purposes.